

Receiving Report

Date: 17/7/29

Batch No: M129 934

Supplier: AINFAOC

Dart P/O: 25178

Packing Slip: Yes No
 Invoice: Yes No
 Receipt: Cash Cr
 New Supplier Yes No

Release Note Attached: Yes No N/A
 Waybill Attached: Yes No
 Shipment Complete: Yes No N/A
 QC18 Inspection _____ N/A
 Work Order _____ N/A

Discrepancies

Part Number	Description	Quantity Ordered	Quantity Rec'd	Quantity Short	Quantity Inspected	Quantity Rejected	Comment / NCR Number
<u>ANSC321</u>		<u>5</u>	<u>0</u>	<u>50</u>			

Initials of Receiver

QC12

C

Production/Admin:

Date _____

Location _____

Received/Costing _____

Initial _____





Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
Tel: 613 632 9577
Fax: 613 632 1053

PURCHASE ORDER

Purchase Order ID **PO25178**

Purchase Order Date 7/28/2014

PO Print Date 7/28/2014

Page Number 1 of 4

Order From : VU-AIR002

AIRFASCO INDUSTRIES
2655 HARRISON AVENUE S.W.
CANTON, OH 44706-3047
US

Ship To : DART AEROSPACE LTD

1270 ABERDEEN
HAWKESBURY, ON K6A 1K7
CANADA

FAXED

Contact Name
Vendor Phone 330 430 6190

Buyer Chantal Lavoie
Customer POID
Customer Tax # 10127-2607
Terms Net 30
Currency USD
FOB Destination-Collect

Ship To Contact
Ship To Phone
Ship Via: FedEx PI ppd
Ship Acct:

Line Nbr	Reference Vendor Part Number	Description/ Mfg ID	Req Date/ Taxable	CD	Req Qty/ Unit of Measure	PO Unit Price	Extended Price
Line Comments			Promise Date				
Delivery Comments							
1	AN3-35A	Bolt	7/31/2014 Yes 7/31/2014	FN	100.00 Each	\$0.46	\$46.00
						Line Total:	\$46.00
2	AN5C15	BOLT	7/31/2014 Yes 7/31/2014	FN	15.00 Each	\$6.00	\$90.00
						Line Total:	\$90.00
3	AN5C32A	BOLT	7/31/2014 Yes 7/31/2014	FN	50.00 Each	\$20.00	\$1,000.00
						Line Total:	\$1,000.00

Note:



Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
Tel: 613 632 9577
Fax: 613 632 1053

PURCHASE ORDER

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Purchase Order Date 7/28/2014
PO Print Date 7/28/2014

Page Number 2 of 4

Order From : VU-AIR002

AIRFASCO INDUSTRIES
2655 HARRISON AVENUE S.W.
CANTON, OH 44706-3047
US

Ship To : DART AEROSPACE LTD
1270 ABERDEEN
HAWKESBURY, ON K6A 1K7
CANADA

Contact Name
Vendor Phone 330 430 6190

Ship To Contact
Ship To Phone
Ship Via: FedEx PI ppd
Ship Acct:

Buyer Chantal Lavoie
Customer POID
Customer Tax # 10127-2607
Terms Net 30
Currency USD
FOB Destination-Collect

Line Total: \$1,000.00

4	AN6-40A	Bolt	7/31/2014 FN Yes 7/31/2014	50.00 Each	\$1.89	\$94.50
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5	AN6-41A	Bolt	7/31/2014 FN Yes 7/31/2014	30.00 Each	\$2.25	\$94.50
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6	MS21042L4	Locknut	7/31/2014 FN Yes 7/31/2014	1,500.00 Each	\$0.15	\$225.00
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Line Total: \$225.00

Note:



Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
Tel: 613 632 9577
Fax: 613 632 1053

PURCHASE ORDER

Purchase Order ID **PO25178**

Purchase Order Date 7/28/2014
PO Print Date 7/28/2014

Page Number 3 of 4

Order From : VU-AIR002

AIRFASCO INDUSTRIES
2655 HARRISON AVENUE S.W.
CANTON, OH 44706-3047
US

Ship To : DART AEROSPACE LTD

1270 ABERDEEN
HAWKESBURY, ON K6A 1K7
CANADA

Contact Name
Vendor Phone 330 430 6190

Buyer Chantal Lavoie

Ship To Contact
Ship To Phone
Ship Via: FedEx PI ppd
Ship Acct:

Customer POID

10127-2607

Customer Tax # Net 30

Terms

Currency USD

FOB

Destination-Collect

7	MS21059L08	Nut	7/31/2014	FN	225.00	\$0.35	\$78.75
				Yes	Each		
			7/31/2014				

						Line Total:	\$78.75
8	MS21059L3	Nut Plate	7/31/2014	FN	400.00	\$0.28	\$112.00
				Yes	Each		
			7/31/2014				

						Line Total:	\$112.00
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Note:



2655 Harrison Ave S.W.
Canton, Ohio 44706
(330)-430-6190
www.Airfasco.com



PHYSICAL AND CHEMICAL CERTIFICATION

AFC LOT NO.: 23266

DATE MFG.: 10/18/2013

SAMPLE SIZE: 10

QTY MFG.: 42,200

PART NO.: AFC59F1032L

PROCUREMENT SPECIFICATION: NASM25027 Dec 2012

CONFORMS TO: MS21059L3 per NASM1059 rev. 2, NAS686A3 rev. 13

HEAT TREAT PROCUREMENT SPECIFICATION: MIL-H-6875 B

VENDOR: Brite Metal CERT NO.: 164516

HARDNESS: HRC 33.00 35.00

PLATING PROCUREMENT SPECIFICATION: Cadmium Plate per AMS-QQ-P-416C, type 2, class 2

VENDOR: Beringer Plating CERT NO.: 76439 PROCESS: .0003" Bake 24 hrs 375 F

LUBE PROCUREMENT SPECIFICATION: SAE AS5272E type 1, bake 1 hour 375 F

VENDOR: Everlube CERT NO.: 13-053 RESULTS: .0003" 96 hr salt spray

NUT MATERIAL: UNS G10500, per ASTM A684, C1050, .035" x 1.50"											
HEAT:	MILL:		COUNTRY OF MELT:		USA						
ELEMENT-ID	-C-	-MN-	-P-	-S-	-SI-	-NI-	-CR-	-MO-	-CU-	-AI-	Other
LADLE	0.510	0.620	0.009	0.002	0.169	0.060	0.080	0.020	0.130	0.023	-
RETAINER MATERIAL: UNS G10500, per ASTM A682, C1050, .025" x 4.060"											
HEAT:	MILL:		COUNTRY OF MELT:		USA						
ELEMENT-ID	-C-	-MN-	-P-	-S-	-SI-	-NI-	-CR-	-MO-	-CU-	-AI-	Other
LADLE	0.520	0.730	0.015	0.004	0.249	0.055	0.163	0.017	0.118	0.035	-

PHYSICAL PROPERTIES	AXIAL TENSILE	TORQUE IN MIN.	TORQUE OUT MAX.	TORQUE REMOVAL	TORQUE OUT RETAINER	PUSH OUT	HARDNESS
REQUIRED	2,460 lbs.	2.0 in-lbs.	18.0 in-lbs.	18.0 in-lbs.	60.0 in-lbs.	150.0 lbs.	HRC 32-34
ACTUAL LOW	3,124 lbs.	8.5 in-lbs.	7.6 in-lbs.	6.4 in-lbs.	109.0 in-lbs.	255.0 lbs.	33.00
ACTUAL AVG.	3,341 lbs.	11.0 in-lbs.	10.3 in-lbs.	9.5 in-lbs.	116.8 in-lbs.	270.7 lbs.	34.00
ACTUAL HIGH	3,506 lbs.	15.0 in-lbs.	14.2 in-lbs.	13.4 in-lbs.	122.0 in-lbs.	292.0 lbs.	35.00

72 hour stress embrittlement test 75% - 80% tensile calculated 60 in-lbs., 1,968 lbs in accordance with MIL-STD-1312/14

Non-Destructive Magnetic Particle per ASTM-E-1444-05 sample lot size: 20

UNS G10500 is not a specialty grade steel per DFAR 252.225-7014.

DFAR complaint 252.225-7014 Domestic Specialty Metals Alternate 1.

Vision Inspected Lot - INSPEC100.

Metallurgical Examination satisfactory.

Made in the USA.

CONTROLLED

We hereby certify that the above data is correct and that the fasteners have been manufactured and inspected in accordance with Airfasco Industries quality requirements.

Airfasco Industries

Quality Assurance Representative:

Tim West



2655 Harrison Ave S.W.
Canton, Ohio 44706
(330) 430-6190
www.Airfasco.com



PHYSICAL TORQUE TEST CERTIFICATION

AFC LOT NO.: 23266 DATE MFG.: 10/18/2013 SAMPLE SIZE: 10 QTY MFG.: 42,200

PART NO.: AFC59F1032L PROCUREMENT SPECIFICATION: NASM25027 Dec 2012

CONFORMS TO: MS21059L3 per NASM1059 rev. 2, NAS686A3 rev. 13

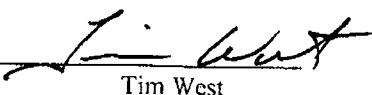
TORQUE TEST: Min. 2.0 in-lbs. max. 18.0 in-lbs. Installations are torque in values. Torques out values is the breakaway and removal unseated in the opposite assembly direction. First, seventh and fifteenth cycles with NAS9703-20 test bolts.

TORQUE SAMPLE	TORQUE 1st in	TORQUE 1st out	TORQUE 1st rem.	TORQUE 7th in	TORQUE 7th out	TORQUE 7th rem.	TORQUE 15th in	TORQUE 15th out	TORQUE 15th rem.	ACCEPT REJECT
1	14.1	12.6	11.4	12.6	10.4	10.0	9.8	8.4	8.0	passed
2	10.6	11.3	10.6	10.8	9.5	8.6	8.7	7.6	6.4	passed
3	13.2	11.5	10.2	9.7	10.1	8.9	10.6	8.8	6.8	passed
4	9.4	9.2	9.1	9.0	9.1	8.7	8.5	8.3	8.2	passed
5	11.6	11.0	10.8	10.3	10.1	9.7	9.7	9.6	9.2	passed
6	13.6	12.1	10.7	11.8	10.4	9.8	10.2	10.0	10.0	passed
7	10.3	9.7	8.8	10.0	9.4	9.0	9.3	8.9	8.1	passed
8	14.9	13.6	12.2	15.0	14.2	13.4	13.6	12.7	11.7	passed
9	11.7	11.3	9.8	10.3	9.5	8.9	9.6	8.8	7.8	passed
10	11.9	11.0	10.8	10.3	10.1	9.7	9.7	9.6	9.2	passed
low	9.4	9.2	8.8	9.0	9.1	8.6	8.5	7.6	6.4	passed
avg.	12.1	11.3	10.4	11.0	10.3	9.7	10.0	9.3	8.5	passed
high	14.9	13.6	12.2	15.0	14.2	13.4	13.6	12.7	11.7	passed

CONTROLLED

We hereby certify that the above data is correct and conforms to the torque test requirements and that the fasteners have been manufactured and inspected in accordance with Airfasco Industries quality requirements.

Airfasco Industries
Quality Assurance Representative:


Tim West



2655 Harrison Ave S.W.
Canton, Ohio 44706
(330) 430-6190
www.Airfasco.com



PHYSICAL TORQUE OUT & EMBRITTLEMENT TEST CERTIFICATION

AFC LOT NO.: 23266

DATE MFG.: 10/18/2013

SAMPLE SIZE: 10

QTY MFG.: 42,200

PART NO.: AFC59F1032L

PROCUREMENT SPECIFICATION: NASM25027 Dec 2012

CONFORMS TO: MS21059L3 per NASM1059 rev. 2, NAS686A3 rev. 13

TORQUE OUT & EMBRITTLEMENT TEST: Minimum of 60 in-lbs. proof load applied in accordance with NASM25027 and NASM21059 with NAS9703 test bolts. An inspection for deformation of the nut and retainer was performed. The required torque load of 75-80% of tensile 1,968 lbs was maintained for hydrogen embrittlement inspection for cracks or nut deformation. After 72 hours minimum an examination under 10X magnification for cracks or deformation was performed and does meet all specification requirements. Torque then increased to failure and method of failure noted.

NUT SAMPLE	TORQUE OUT 72 in-lbs. min.	TORQUE OUT TO FAILURE	DATE and TIME TORQUED UP	DATE and TIME INSPECTED	ACCEPT REJECT	METHOD OF FAILURE
1	60.0	118.0	10/14/13 9:30 AM	10/17/13 9:30 AM	passed	strip deformations
2	60.0	115.0	10/14/13 9:30 AM	10/17/13 9:30 AM	passed	strip deformations
3	60.0	122.0	10/14/13 9:30 AM	10/17/13 9:30 AM	passed	strip deformations
4	60.0	120.0	10/14/13 9:30 AM	10/17/13 9:30 AM	passed	strip deformations
5	60.0	120.0	10/14/13 9:30 AM	10/17/13 9:30 AM	passed	strip deformations
6	60.0	115.0	10/14/13 9:30 AM	10/17/13 9:30 AM	passed	strip deformations
7	60.0	118.0	10/14/13 9:30 AM	10/17/13 9:30 AM	passed	strip deformations
8	60.0	115.0	10/14/13 9:30 AM	10/17/13 9:30 AM	passed	strip deformations
9	60.0	116.0	10/14/13 9:30 AM	10/17/13 9:30 AM	passed	strip deformations
10	60.0	109.0	10/14/13 9:30 AM	10/17/13 9:30 AM	passed	strip deformations
low		109.0				
avg.		116.8				
high		122.0				

CONTROLLED

We hereby certify that the above data is correct and conforms to the test requirements and that the fasteners have been manufactured and inspected in accordance with Airfasco Industries quality requirements.

Airfasco Industries

Quality Assurance Representative:

Tim West



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Canton, Ohio 44706
(330) 430-6190
www.Airfasco.com



PHYSICAL PUSH OUT ASSEMBLY TEST CERTIFICATION

AFC LOT NO.: 23266

DATE MFG.: 10/18/2013

SAMPLE SIZE: 10

QTY MFG.: 42,200

PART NO.: AFC59F1032L

PROCUREMENT SPECIFICATION: NASM25027 Dec 2012

CONFORMS TO: MS21059L3 per NASM1059 rev. 2, NAS686A3 rev. 13

PUSH OUT ASSEMBLY TEST: 100 lbs. min. (proof load) inspection for push out nut from the retainer assembly applied with NAS9703-20 test bolts. After minimum proof load an examination under 10X magnification for deformation was performed and does meet specification requirements. Force then increased to 150% of minimum requirement then increased force applied to failure and method of failure noted.

NUT SAMPLE	PUSH OUT 100 lbs. min.	PUSH OUT 150 lbs. (P/L)	PUSH OUT TO FAILURE	ACCEPT REJECT	METHOD OF FAILURE
1	100.0	150.0	270.0	passed	retainer deformation
2	100.0	150.0	255.0	passed	retainer deformation
3	100.0	150.0	259.0	passed	retainer deformation
4	100.0	150.0	265.0	passed	retainer deformation
5	100.0	150.0	284.0	passed	retainer deformation
6	100.0	150.0	272.0	passed	retainer deformation
7	100.0	150.0	258.0	passed	retainer deformation
8	100.0	150.0	267.0	passed	retainer deformation
9	100.0	150.0	292.0	passed	retainer deformation
10	100.0	150.0	285.0	passed	retainer deformation
low			255.0		
avg.			270.7		
high			292.0		

CONTROLLED

We hereby certify that the above data is correct and conforms to the torque test requirements and that the fasteners have been manufactured and inspected in accordance with Airfasco Industries quality requirements.

Airfasco Industries
Quality Assurance Representative:

Tim West



2655 Harrison Ave S.W.
Canton, Ohio 44706
(330) 430-6190
www.Airfasco.com



PHYSICAL AXIAL TENSILE TEST CERTIFICATION

AFC LOT NO.: 23266 DATE MFG.: 10/18/2013 SAMPLE SIZE: 10 QTY MFG.: 42,200

PART NO.: AFC59F1032L PROCUREMENT SPECIFICATION: NASM25027 Dec 2012

CONFORMS TO: MS21059L3 per NASM1059 rev. 2, NAS686A3 rev. 13

AXIAL TENSILE TEST: Method NASM1312-8 (Formerly MIL-STD-1312/8) 2,460 min. lbs. proof load inspection for nut deformation. Maximum load increased to failure before deformation, stripped threads or NAS9703-20 test bolt failure.

TENSILE SAMPLE	PROOF LOAD 2,460 LBS.	TENSILE TO FAILURE LBS.	METHOD OF FAILURE	ACCEPT REJECT
1	2,460	3,288	strip deformation	passed
2	2,460	3,476	strip deformation	passed
3	2,460	3,265	strip deformation	passed
4	2,460	3,286	strip deformation	passed
5	2,460	3,506	strip deformation	passed
6	2,460	3,124	strip deformation	passed
7	2,460	3,327	strip deformation	passed
8	2,460	3,492	strip deformation	passed
9	2,460	3,356	strip deformation	passed
10	2,460	3,285	strip deformation	passed
low		3,124		
avg.		3,341		
high		3,506		

CONTROLLED

We hereby certify that the above data is correct and conforms to the axial tensile test requirements and that the fasteners have been manufactured and inspected in accordance with Airfasco Industries quality requirements.

Airfasco Industries
Quality Assurance Representative:

Tim West



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Canton, Ohio 44706
(330) 430-6190
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METTALURGICAL EXAMINATION

AFC LOT NO.: 23266

DATE MFG.: 10/18/2013

SAMPLE SIZE: 10

QTY MFG.: 42,200

PART NO.: AFC59F1032L

PROCUREMENT SPECIFICATION: NASM25027 Dec 2012

CONFORMS TO: MS21059L3 per NASM1059 rev. 2, NAS686A3 rev. 13

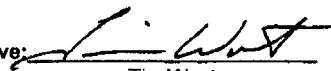
MICRO EXAMINATION: The microstructure shows tempered martensitic grains. No decarburization or carburization was noted visually under 100X magnification. Mount shows flow lines are continuous and follow the general contour of the part as formed by the cold forming process. No indications of cracks, laps, seams or other defects were noted. Rockwell hardness HRC, Superficial 15-N, and Tukon micro-hardness Knoop / Vickers scale was performed. Material as mounted and inspected is satisfactory as inspected and conforms to specification requirements.

NUT					
HARDNESS SAMPLE	HRC	15-N	KNOOP	VHN	ACCEPT REJECT
1	33	77	334	327	ACC
2	33	77	334	327	ACC
3	33	77	334	327	ACC
4	34	77	342	336	ACC
5	33	77	334	327	ACC
6	33	77	334	327	ACC
7	34	77	342	335	ACC
8	34	77	341	335	ACC
9	34	77	341	336	ACC
10	33	77	334	327	ACC
low	33	77	334	327	ACC
avg.	33	77	337	330	ACC
high	34	77	342	338	ACC

CONTROLLED

We hereby certify that the above data is correct and conforms to the metallurgical test requirements and that the fasteners have been manufactured and inspected in accordance with Airfasco Industries quality requirements.

Airfasco Industries
Quality Assurance Representative:



Tim West

AIRFASCO INDUSTRIES QUALITY CONTROL FORM 1011N ME

EXAMINATION OF PRODUCT

AFC LOT NO.: 23266

DATE MFG.: 10/18/2013

SAMPLE SIZE: 10

QTY MFG.: 42,200

PART NO.: AFC59F1032L

CONFORMS TO: MS21059L3 per NASM1059 rev. 2, NAS686A3 rev. 13

PROCUREMENT SPECIFICATION: NASM25027 Dec 2012

#	CHARACTERISTICS	MAX.	MIN.	SAMPLE 1	SAMPLE 2	SAMPLE 3	SAMPLE 4	SAMPLE 5	SAMPLE 6	SAMPLE 7	SAMPLE 8	SAMPLE 9	SAMPLE 10
1	"A" LENGTH	.948	-	.919"	.918"	.920"	.919"	.918"	.918"	.918"	.919"	.919"	.920"
2	"B" WIDTH	.416	.290	.402"	.403"	.403"	.399"	.402"	.400"	.401"	.403"	.403"	.400"
3	"D" DIAMETER	-	.194	.220"	.219"	.219"	.220"	.220"	.220"	.220"	.219"	.220"	.220"
4	"P" DIAMETER	.270	.250	.265"	.265"	.265"	.265"	.265"	.265"	.265"	.265"	.265"	.265"
5	"H" HEIGHT	.250	-	.242"	.240"	.243"	.241"	.238"	.242"	.241"	.240"	.241"	.238"
6	"J" LOCATION	.690	.686	.688"	.688"	.688"	.688"	.688"	.688"	.688"	.688"	.688"	.688"
7	"K" DIAMETER	.103	.098	.099"	.099"	.099"	.099"	.099"	.099"	.099"	.099"	.099"	.099"
8	"V" THICKNESS	.032	-	.027"	.027"	.027"	.027"	.027"	.027"	.027"	.027"	.027"	.027"
9	"F" LOCATION	-	.100	.110"	.110"	.110"	.110"	.110"	.110"	.110"	.110"	.110"	.110"
10	PRESENCE OF LOGO	-	-	ACC									
11	THREADS /T/ .190-32 UNJC-3B	-	-	ACC									
12	BEARING SURFACE ROUGHNESS	< 125	-	60	60	60	60	60	60	60	60	60	60

Examination of product in accordance with NASM25027 1, Dec 2012.

Airfasco Industries
Quality Assurance Representative:


Tim West

CONTROLLED

15May08 6:38 TEST CERTIFICATE No: CLE 213908
 S014 BY:
 THREE B METALS, INC.
 5402 INNOVATION DRIVE
 VALLEY CITY, OHIO 44280
 Tel: 330 220 0451 Fax: 330 220 0471 P/O No M20030-02
 Roi S/O No CLE 10428-001
 S/L No CLE 118818-003 Inv No 15May08
 Inv No

CERTIFICATE OF ANALYSIS and TESTS Cert. No: CLE 213908
 15May08
 Part No 1902504004
 C10090 C.R. SPRING STEEL ANNEALED
 .0250 Nom X 4.0000" Pcs Wgt
 4 3.705
 Heat Number Tap No Pcs Wgt
 280353 534587 4 3.705
 HV= <88> / RECAR= <.00" / ELONG= <28.5%> / T3psi= <73,000psi>
 YSpsi= <37,000psi> / N= <22> / R= <9085F>

Heat Number Chemical Analysis Pcs
 280353 ORIGIN= <US> C= <.52> Mn= <.750> P= <.015> S= <.004> Si= <.240>
 Cr= <.118> Ni= <.055> Cr= <.165> Mo= <.017> Al= <.055> N= <.005>
 V= <.002> Nb= <.001> Ti= <.005> Sb= <.003> ASTM= <A563> / ASTM= <A684>
 SAE= <J403>

THIS IS TO CERTIFY THAT THE CHEMICAL ANALYSIS
 AND/OR PHYSICAL TEST RESULTS EXHIBITED HEREIN ARE
 CORRECT, AS CONTAINED WITHIN THE RECORDS
 OF THE COMPANY.

QUALITY MANAGER

John Bokh, Jr.
 John Bokh, Jr.

CONTROLLED

CERTIFICATE OF CONFORMANCE

CONSOLIDATED METAL SERVICE, INC
4764 TOPPS INDUSTRIAL PARKWAY
WILLOUGHBY, OH 44094
440-954-6800

6/26/13

Page# 1

TO:

AIRFASCO INDUSTRIES, INC.
2655 HARRISON AVE SW
CANTON, OH 44706

SHIP TO:

AIRFASCO INDUSTRIES, INC.
2655 HARRISON AVE. SW
CANTON OH 44706
330-430-6190

SIZE: .035 X 1.50 X COIL
GRADE: 1050 ANNEALED PER ASTM A684 & AMS 5085
COUNTRY OF ORIGIN: USA

Bill/Ladng# 002563 B/L Date 6/26/13 Sales Ordr: 802341 01
Cast. P/O#: 43331

Tag# 604704 01 Heat# NLPR0072D MasterTag# 202874 01
C : .52 Mn: .64 P : .008 S : .002 Al: .029 Si: .210
Ti: .002 Mo: .02 Cu: .15 Cr: .05
Sn: .031 Ca: .0005 N : .007 B : .0001 Ni: .06
Rock: RB 75

Tag# 604705 01 Heat# NLPR0072D MasterTag# 202874 01
C : .52 Mn: .64 P : .008 S : .002 Al: .029 Si: .210
Ti: .002 Mo: .02 Cu: .15 Cr: .05
Sn: .031 Ca: .0005 N : .007 B : .0001 Ni: .06
Rock: RB 75

CONTROLLED

WE HEREBY CERTIFY THE ABOVE FIGURES ARE ACCURATELY STATED, MEET YOUR
MATERIAL REQUIREMENTS AND ARE TRACEABLE IN OUR RECORDS BACK TO THE
PRODUCER AND/OR AN ACCREDITED TEST LABORATORY.

.....
QUALITY ASSURANCE MANAGER

BRITE METAL

CERTIFICATION OF PROCESS

CUSTOMER: AIRFASCO INDUSTRIES, INC
2655 HARRISON AVE SW
CANTON OH 44706

THIS IS TO CERTIFY THAT BRITE METAL INC. HAS PROCESSED THE FOLLOWING MATERIAL IN ACCORDANCE WITH THE MOST WIDELY ACCEPTED METALLURGICAL PROCEDURE.

PO #: 60369 **WEIGHT:** 157 LBS **NO. BINS:** 1 **NO. PCS:** 42,200

PN#: AFC59F-1032 **LOT#:** 23266 **BM ORDER NO:** 164516

MTL#: 1050 **CORE HARDNESS:** HRC 33-35

PROCESS TO: AMS-H-6875 B

DATE RECEIVED: 08/27/13 **DATE SHIPPED:** _____

HEAT TREATING TEST RESULTS

NUMBER OF SAMPLES: 3

CORE HARDNESS: 33-34 RC

SURFACE HARDNESS: 33-34 RC @ .003

CASE DEPTH: _____

CONTROLLED

INSPECTOR: jl

DATE: 8/29/13

Approved by Bruce Hogie
Revision Date: 2/13/2013

CERTIFICATE OF COMPLIANCE

SUPPLIER: BERINGER PLATING, INC.
1211 DeValera Ave.
Akron, OH 44310
330-633-8409 Fx 330-633-8447
sales@beringerplating.com

CUSTOMER: Airfasco Industries, Inc.

Beringer Invoice: 76439

P.O. Number: 60393

Part Number: MS21059L3

Lot Number: 23266

Lot Quantity: 42,200 pcs

Specification: Cadmium Plate per AMS-QQ-P-416C Type II, Class 2

Mercury Free Clause: No possibility exists for mercury contamination to occur during processing or testing of parts on this contract.

Coating Thickness: .0003 inches

Embrittlement Relief

Baked: 24 Hours at 375 F Within 1 Hour of Plating.

Inspection Level to applicable standard: ACC. X

S-3 of MIL-STD-105D: 4 %

ASTM B602 Table II: 1.50%

Aircraft Braking System: 1%

Certified By:

James Beringer Jr.
President

Date: 9/24/2013

CONTROLLED

AIRFASCO Industries

2655 Harrison Avenue SW Canton, OH 44706

Nondestructive Testing Certification Wet Fluorescent Magnetic Particle Inspection Technique

Part Data

Part Number	Lot Number	Dimensions	Part Description
MS21059L3	23266	.190-32 UNJF-3B	NUT, SELF-LOCKING, PLATE, TWO LUG, FLOATING, LOW HEIGHT STEEL, 125 KSI Ftu, 450°F

Reference Data

Specification	Procedure Number	Acceptance Criteria
ASTM E1444-05	MT-1	No Cracks, NASM25027

Inspection Equipment Data

Model Number	Manufacturer	Serial Number
H-800 Retro	Magnaflux Corporation	91R00150

Inspection Material Data

Particles	Mfr	Batch No.	Carrier	Mfr	Batch No.
14A	Magnaflux	10G078	MG II	Magnaflux	11K065

Technique Data

Type Current	Circular Field		Longitudinal Field	
	Headshot Amps	Central Conductor Amps	Coil shot Amps	Coil Turns
FWDC	N/A	200	N/A	5

Particle application by the flow method, continuous technique
Demagnetization performed by the AC Coil method, Residual field +/- 3

Inspection Results

Lot Size	Inspection Sample Size	Quantity accepted	Quantity rejected
42200	32	32	0

Notes: Circular mag only per NASM25027

Performed by / Level	Reviewed & Approved by:	Date
		10/10/13
D. SHOUP ASNT NDT LEVEL III	D. SHOUP ASNT NDT LIII #176608	

CONTROLLED

EVERLUBE® PRODUCTS

TEST REPORT

DATE: 3/01/2013
PRODUCT: Everlube® 620C
SPECIFICATION: SAE AS5272E, Type I
BATCH NUMBER: PC-13624
DATE OF MANUFACTURE: 2/28/2013
MANUFACTURING SITE: Peachtree City, GA
TEST REPORT NUMBER: 13-053
CUSTOMER P.O. #: 43263

DATE OF
MAR 18 2014

EXPIRATION

TEST RESULTS

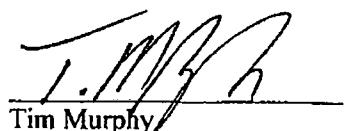
PARAGRAPH	TEST	REQUIREMENTS	RESULTS
3.3	Film Appearance	Pass	Pass
3.3	Film Thickness	All Specimens 0.0003" – 0.0005" with no single readings less than 0.0002" or greater than 0.0007".	All Specimens 0.0003" – 0.0005"
3.4.1	Film Adhesion (ASTM D-2510, Procedure A)	Pass Per Spec	Pass
3.4.4	Endurance Life (ASTM D-2625, Procedure A)	250 Min. Avg. None < 210 Min.	Test # 1 = 290 Min. Test # 2 = 260 Min. Test # 3 = 275 Min. <u>Test # 4 = 305Min.</u> Test Average = 283 Min.
3.4.5	Load Carrying Capacity (ASTM D-2625, Procedure B)	2500 Lbf. Avg. None < 2250 Lbf.	Test # 1 = 2750 Lbf. <u>Test # 2 = 2750 Lbf.</u> Test Average = 2750 Lbf.
3.4.7	Sulfurous Acid-Salt Spray	Pass 4 Cycles	Pass
3.4.9	Solids Content	40% Minimum	43.7 %

CERTIFICATE OF CONFORMANCE

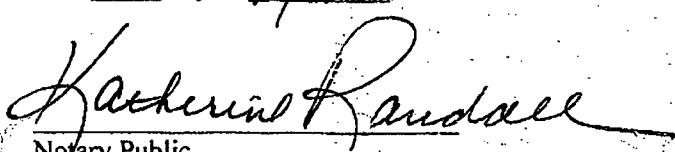
EVERLUBE PRODUCTS HEREBY CERTIFIES THAT THIS PRODUCT CONTAINS NO GRAPHITE OR POWDERED METALS AND HAS BEEN EVALUATED AGAINST THE QUALITY CONFORMANCE REQUIREMENTS OF SAE AS5272, TYPE I, AND CONFORMS TO THE REQUIREMENTS OF THAT SPECIFICATION.

CONTROLLED

CERTIFIED BY:


Tim Murphy
Quality Assurance Technician
Carl H. Van Acker
Quality Assurance Manager

Sworn to and subscribed before me
This 1 day of March 2013


Katherine Randall
Notary Public



2655 Harrison Ave. SW
Canton, Ohio 44706-3047
Phone: 330-430-6190
Fax: 330-430-6199

CERTIFICATE OF CONFORMANCE

DART AEROSPACE

I hereby certify that on 07/28/14 Airfasco Industries provided the supplies called for by Contract/PO Number PO25178 in accordance with all applicable requirements for shipment. I further state/ that the process certifications are in conformance with the contract requirements, including specifications and/or drawings, physical item identification (part number) and the quantity shown on this or attached acceptance document. The part numbers certified below have been manufactured in the United States.

Quality Assurance Representative

WM. DENT



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Canton, Oh. 44706
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AIRFASCO CONDITIONS OF ACCEPTANCE

Re: Purchase Order Number PO29178 with
DART AEROSPACE, ("Buyer"), for
MS21042L1, ("Nuts")

The following constitute material conditions, ("Conditions"), of Buyer's acceptance of the Nuts. Buyer's acceptance of the delivery of the Nuts from Airfasco to Buyer shall constitute Buyer's acknowledgment and acceptance of the Conditions.

A. Installation: The specifications for the manufacture of the Nuts contemplate the use of calibrated hand tools for the installation of the Nuts. Accordingly, and for purposes of the installation of the Nuts, it is imperative that Buyer (and/or the end user(s) of the Nuts):

- (1) Use calibrated hand tools to install the Nuts.
- (2) Verify and assure the correct pitch diameter of the male mate(s), the appropriate assembly torque range and hardness of the male mate(s) (otherwise the Nuts are and will be prone to splitting, cracking and/or failure).
- (3) Inspect all Nuts and verify a torque test for 1 week/168 hours a quantity of 1% or 20 Nuts whichever is less of each lot. Test must be performed with male mate(s) intended for final assembly. Discard test Nuts and do not re-use fasteners.

Buyer (and any end user(s) of the Nuts) wholly assume any and all risks of the failure of any Nuts if anything excepting for calibrated hand tools are used to install (or remove) the Nuts (as the RPM speed and torque pressures of air tools, for example, can readily damage the Nuts and/or cause the Nuts to fail).

B. Use: The specifications for the Nuts were intended for weight saving applications. Thus, the Nuts have relatively thin walls. See referenced least material condition (LMC) drawing attached for size purchased. The nuts have defined limitations per NASM33588, MS21042 note 3 and are not designed and manufactured for use in/for critical applications. There are many alternate forms of hardware choices that are designed, manufactured and suitable for critical applications. While Airfasco does not advise and/or recommend the use of the Nuts for critical applications (and contrarily advises/recommends that the Nuts not be used for critical applications) certainly should Buyer (or any end user(s)) choose to use the Nuts for critical applications, Buyer (and/or any end user(s)) should (at a minimum) obtain one hundred percent (100%) NDT, C=0 inspection, ("Inspection"), of all Nuts (and reject any Nuts having any imperfection(s)). Buyer (and any end user(s)) wholly assume any and all risks of the failure of any Nuts if and/or where the Nuts are or will be used in/for critical applications.

C. Inspection: Airfasco does offer and can provide 100% NDT Inspection of/for the Nuts (at an additional cost) if Buyer (and or any end user(s)) want to order/obtain such Inspection. Buyer (and/or any end user(s)) wholly assume any and all risks of the failure(s) of any Nuts for any use(s)/application(s) unless Buyer (or any end user(s)) obtain the Inspection. Airfasco does perform the sample lot inspections as required per the specifications.

D. Technical Quality Notice Bulletin: Attached hereto is the Technical Quality Notice Bulletin, ("Bulletin"), that Airfasco has published relative to the Nuts (and/or similar hardware) which identifies and addresses issues of importance/ concern. Buyer (and any end user(s)) need to carefully review the Bulletin.

Airfasco manufactured the Nuts pursuant to applicable specifications. The NASM33588 and AFC33588 specification for the Nuts do not contemplate or intend:

- (1) The use of the Nuts in critical applications (and certainly not the "re-use(s)" thereof); and/or,
- (2) The use of anything excepting for calibrated hand tools to install (or remove) the Nuts.



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August 20, 2012

TECHNICAL QUALITY NOTICE BULLETIN MS21042 & NAS1291 450 F STEEL:
(THIN WALL, LIGHTWEIGHT HEX FLANGE NUTS)

The MS21042 and NAS1291 steel design is a very thin wall, lightweight hex flange design (LMC drawings attached) along with the wide range of available torque values and high tensile heat treat values. These nuts are susceptible to galling and post torque ductile overload failure. We have seen the use of high speed RPM air assembly tools which increase the galling process. The steel MS21042 450 F nuts have a higher axial strength pound minimum requirement from the procurement standard of 125,000 PSI minimum per NASM25027.

Through our customers, Airfasco has become aware that a few MS21042 and NAS1291 steel nuts have cracked. Other manufacturers of nuts have had similar reports. Airfasco has not verified the installation or the class 3A thread pitch diameter of the male mate(s) and has not confirmed whether the failure resulted from high over values from galling leading to ductile failure from installation. The customer's evaluation and analysis reflected classic failures of hydrogen embrittlement (HE). Hydrogen assisted cracking (HAC) of alloy steel, high tensile strength and electrodeposited cadmium plated hardware has been an ongoing quality issue in the industry for over 50 years.

The specifications for the nuts were intended for weight saving applications and have relatively thin walls. This design series of nuts have defined limitations per AFC33588 and referenced NASM33588, MS21042 note 3 for critical applications. Many alternate forms of hardware choices that are designed, manufactured and suitable for critical applications. Airfasco has published a "Reliability, Usage, Weight and Least Material Condition (LMC) selection guide. The original nut this series replaced was the NAS679, 125,000 PSI minimum which was only intended primarily for shear applications. The MS21042 and NAS1291 steel thin wall hex flange nut was designed for a replacement with a higher axial tensile strength for both shear and tensile applications.

Designers and Engineers are advised to check with Airfasco to determine availability of torque value ranges and hardness ranges along with new improved technical designs for special applications to improve the use of these nuts. Airfasco has authorized distributors that offer managed inventory programs for OEM's.

Before installation, verify a torque test for 1 week, a quantity of 1% or 20 nuts, whichever is less and assure the correct pitch diameter of the male mate(s), the appropriate assembly torque range and the hardness of the male mate(s). Assemble using calibrated hand tools as RPM speed and torque pressures of air tools can readily gall and damage the nuts if out of calibration tools are used.

Galling is a form of adhesive wear that can occur in fasteners as they are tightened. Galling is most prevalent in fasteners made from corrosion resistant materials that self-generate a protective oxide surface film [such as stainless steel, aluminum, titanium and nickel based alloys]. As contact pressure increases on the sliding surfaces of the threads during tightening, the oxide layer is stripped off high points on the mating surfaces and the bare unprotected surfaces 'cold weld' together. As the fastener tightening continues, these localized cold welded joints shear, tearing off metal particles. Debris from the stripped oxide film and particles from the sheared joints are entrained in the sliding surfaces which exacerbate the adhesive wear. The process can ultimately lead to seizing of the fasteners and breakage if tightening continues. Seizing can even occur during the loosening process.

Galling is best avoided by: (1) Installation using calibrated hand tools to slow down the RPM tightening process since increased speed generates greater heat from friction and heat accelerates the 'cold weld' process; and/or (2) Providing lubrication, either solid film or anti-galling compound to the threads prior to assembly (see SAE J2270 for additional information); (3) Carefully evaluating the thread fit of the male mate(s) threads. The MS21042 and NAS1291 specify a class 3B thread fit and at maximum material condition with a class 3A male mate(s) thread, there is zero clearance between mating threads. Using a class 2A external thread with these nuts provides some clearance between threads, even at maximum material condition. When design considerations dictate the use of materials for which there is no experience, an evaluation of the material couple's resistance to galling should be made to assess the risk of failures during installation. ASTM G98 provides a test method for evaluating the galling resistance and determining threshold galling stress. This threshold can then be compared to analytically determine contact pressures of the threaded joint during tightening to provide an assessment of the fastener design. (4) Selecting different alloys with different hardness values or different strengths of the same alloy, thereby providing different hardness values in the threaded joint.

Require all electro-platers to initiate a hydrogen embrittlement prevention (HEP) requirement making it mandatory for plating processors to begin baking immediately after plating and not to exceed one (1) hour for the twenty three (23) hours minimum baking requirement temperature of 375 F degrees +/- 25 F (190 C +/- 14 C). This will reduce the possibility of hydrogen embrittlement (HE) and post hydrogen assisted cracking (HAC).

The use of the electro-plating process with any anode base metals on this type of thin wall nut hardware will cause the classic effects of hydrogen embrittlement (HE). Following hydrogen embrittlement prevention (HEP) techniques will minimize the amount of hydrogen embrittlement (HE) and reduce post hydrogen assisted cracking (HAC), but not remove all concentrations of hydrogen content because of the cadmium electro-plating process.

The electro-plating finish of anode cadmium metal along with a post chromate finish treatment are both considered a candidate of "Substance of Very High Concern" (SVHC) with the European Chemicals Health Agency (ECHA) located in Helsinki. These metals and chemicals are NOT compliant with the "Registration, Evaluation, Authorization and Restriction of Chemical" (REACH) substances and the directive "Restriction of Hazardous Substances" (RoHS). REACH in brief calls for the progressive substitution of the most dangerous chemicals when suitable alternatives have been identified. Aerospace is no longer exempt and Article 33 (1) REACH may allow the recipient of the nut provided the concentration of (SVHC) is less than 0.1% weight/weight (w/w) and sufficient information is submitted to determine safe application and installation use. To plate 4,536 kg (10,000 lbs.) of bare steel nuts requires approximately 14 kg (31 lbs.) of cadmium metal and approximately 2 liters (2.12 quarts) of post treatment chromate.

Airfasco suggests an additional hydrogen embrittlement wedge testing (HEWT) of 85% tensile strength for a minimum of 72 hours with a 10 degree wedge test fixture for additional rigorous testing as well as the required standard parallel fixture per NASM1312-5, T=KD/W.

Torque specification range of NASM25027 has a very wide tolerance that can affect final assembly depending on the matting fasteners being used. We have developed a lower torque (LT) series which conforms to lower allowable range of NASM25027 torque specifications. We feel using a lower torque range will create more of an allowable tolerance for the use of dissimilar metals and coatings used in final assembly. We conducted conformance testing and have reduced the hardness range and torque values for use with lower tensile matting fasteners such as the AN bolts and standard 125,000 PSI minimum machine screws. Included in this bulletin is the lower torque (LT) series of MS21042 and NAS1291 steel product line that is recommended.

It should be noted that many distributors sell standard hardware purchase to the minimum sampling plan. It has been brought to our attention that many of the OEM's require additional flow down quality requirements such as C=0 and the standard sampling plan of ANSI/ASQZ1.4-2003 is not acceptable. Many of our OEM's will assign additional flow down quality requirements when purchasing standard AN, MS or NAS hardware and have them 100% NDT Magnaflux tested per ASTM E 1444-11 for their critical applications. NDT per ASTM E 1444-11 sample lot testing is only required on nuts .1900-32 inch (4.83 mm) and larger and not a requirement for the smaller nuts sizes per NASM25027, 4.5.4.1.

Any products manufactured in quantity from all of the manufacturers will always have a very small percentage of fallout when 100% NDT testing is performed. Airfasco does offer and can provide 100% NDT, C=0 for the nuts at an additional cost and reject on any imperfections which exceeds the minimum inspection requirements of NASM25027 Table VII (7) allowing limits of .010" (.25 mm) depths for laps, seams and inclusions.

With reported problems from various manufacturers we feel there are many variables that can cause these problems. The use of out of calibrated hand tools or the use of high RPM assembly of non calibrated lower cost air tools without certified regulated air pressure can readily gall and damage the nuts. If too long of a bolt or screw with a shoulder is used this can create a wedge effect and crack the nut. A high 3A pitch diameter makes for a zero clearance between mating threads and can cause galling during assembly with failure due to over torque or ductile failure. We do recommend anti-galling compound to the male threads prior to assembly per SAE J2270. This will slow the tightening process since increased speeds generate greater heat from friction and heat accelerates the "cold weld" process. We feel the use of lower torque nuts may help this problem and we have attached drawings in the report.

MS21043 and NAS1291C stainless A286 nuts of the same thin wall, light exact design and weight have lower axial tensile strengths of 125,000 PSI minimum and should be considered when design application permits. NAS1291- Rev 13 steel sizes less than .375-24" (9.525 mm) and under axial tensile strengths are crossed off the current drawing and inactive for new design. Airfasco has published a design selection guide referencing the different thread sizes, weights, torque value ranges, axial tensile strength, plating finishes and least material condition (LMC). An illustration of all the sizes for least material condition (LMC) is attached for reference.

Airfasco has designed a hydrogen embrittlement negative (HEN) series of the MS21042 and NAS1291 450 F steel thin walled hex flange nut that is a cadmium replacement, RoHS and REACH compliant finish. The nut meets all the physical, chemical and mechanical properties of the specification except for the improved finish which far exceeds the cadmium salt spray requirements. Totally chrome free finish that exceeds > 2,000 hours salt spray corrosion. The process is a thermal diffusion coating (TDC) at 400 C (752 F) which eliminates any chances of hydrogen embrittlement by process application per ASTM A1059. This finish has the same friction factor (K) as cadmium and provides the same natural lubricant for installation assembling and removal.

Key Words: ASTM A1059 Standard for Zinc Alloy Thermo-Diffusion Coatings (TDC) on Steel Fasteners, European Chemicals Health Agency (ECHA), Hydrogen Assisted Cracking (HAC), Hydrogen Embrittlement (HE), Hydrogen Embrittlement Negative (HEN), Hydrogen Embrittlement Wedge Testing (HEWT), Least Material Condition (LMC), Lower Torque (LT), NASM25027 PROCUREMENT SPECIFICATION, NASM33588 USAGE LIMITATION RELIABILITY REQUIREMENTS, Non Destructive Testing (NDT), Registration Evaluation Authorization and Restriction of Chemical (REACH), Restriction of Hazardous Substances (RoHS), Substance of Very High Concern (SVHC), Thermal Diffusion Coating (TDC), Weight to Weight (W/W).

Please contact Dennis Dent Dennis.Dent@Airfasco.com if you have any questions or need any additional information or assistance.



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PHYSICAL AND CHEMICAL CERTIFICATION

AFC LOT NO.: 24274

DATE MFG.: 4/24/2014

SAMPLE SIZE: 10

QTY MFG.: 49,700

PART NO.: AFC59-832

PROCUREMENT SPECIFICATION: NASM25027 Rev 1 12/21/2012

CONFORMS TO: MS21059L08 per NASM1059 rev. 2, NAS686A3 rev. 13

HEAT TREAT PROCUREMENT SPECIFICATION: MIL-H-6875 B, HRC 33.00 – 35.00

VENDOR: Brite Metal

CERT NO.: 166181

HARDNESS: HRC 34.00 35.00

PLATING PROCUREMENT SPECIFICATION: Cadmium Plate per AMS-QQ-P-416C type 2, class 2

VENDOR: Beringer Plating

CERT NO.: 79706

PROCESS: .0003" Bake 24 hrs 375 F

LUBE PROCUREMENT SPECIFICATION: SAE AS5272E type 1, bake 1 hour 375 F

VENDOR: Everlube

CERT NO.: PC-14506

RESULTS: .0003" 96 hr salt spray

NUT MATERIAL: UNS G10500, per ASTM A684, C1050, .0350" x 1.50"											
HEAT:	MILL:		COUNTRY OF MELT:			USA					
ELEMENT-ID	-C-	-MN-	-P-	-S-	-SI-	-NI-	-CR-	-MO-	-CU-	-Al-	Other
LADLE	0.520	0.640	0.008	0.002	0.210	0.060	0.050	0.020	0.150	0.029	-
RETAINER MATERIAL: UNS G10500, per ASTM A682, C1050, .025" x 4.060"											
HEAT:	MILL:		COUNTRY OF MELT:			USA					
ELEMENT-ID	-C-	-MN-	-P-	-S-	-SI-	-NI-	-CR-	-MO-	-CU-	-Al-	Other
LADLE	0.520	0.730	0.015	0.004	0.249	0.055	0.163	0.017	0.118	0.035	-

PHYSICAL PROPERTIES	AXIAL TENSILE	TORQUE IN MIN.	TORQUE OUT MAX.	TORQUE REMOVAL	TORQUE OUT RETAINER	PUSH OUT	HARDNESS HRC 33-35
REQUIRED	1,720 lbs.	1.5 in-lbs.	15.0 in-lbs.	15.0 in-lbs.	60.0 in-lbs.	80.0 lbs.	34-35
ACTUAL LOW	2,358 lbs.	7.0 in-lbs.	6.0 in-lbs.	6.0 in-lbs.	120.0 in-lbs.	225.0 lbs.	34.00
ACTUAL AVG.	2,429 lbs.	9.0 in-lbs.	8.4 in-lbs.	7.9 in-lbs.	125.8 in-lbs.	239.2 lbs.	34.50
ACTUAL HIGH	2,512 lbs.	10.8 in-lbs.	10.2 in-lbs.	9.4 in-lbs.	132.0 in-lbs.	252.0 lbs.	35.00

72 hour stress embrittlement test 85% of tensile calculated at 39 in-lbs., 1,968 lbs in accordance with NASM 1312-14

Non-Destructive Magnetic Particle per ASTM-E-1444-05 sample lot size: 10

100% Inspected Lot, C=0, 0/PPM - INSPEC100

UNS G10500 is not a specialty grade steel per DFAR 252.225-7014.

DFAR complaint 252.225-7014 Domestic Specialty Metals Alternate 1.

Made in the USA.

CONTROLLED

We hereby certify that the above data is correct and that the fasteners have been manufactured and inspected in accordance with Airfasco Industries quality requirements.

Airfasco Industries

Quality Assurance Representative:

Tim West



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Canton, Ohio 44706
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PHYSICAL TORQUE TEST CERTIFICATION

AFC LOT NO.: 24274 DATE MFG.: 4/24/2014 SAMPLE SIZE: 10 QTY MFG.: 49,700

PART NO.: AFC59-832

PROCUREMENT SPECIFICATION: NASM25027 Rev 1 12/21/2012

CONFORMS TO: MS21059L08 per NASM1059 rev. 2, NAS686A3 rev. 13

TORQUE TEST: Min. 1.5 in-lbs. max. 15.0 in-lbs. Installations are torque in values. Torques out values is the breakaway and removal unseated in the opposite assembly direction. First, seventh and fifteenth cycles with MS16997 (3A) test screws.

TORQUE SAMPLE	TORQUE 1st in	TORQUE 1st out	TORQUE 1st rem.	TORQUE 7th in	TORQUE 7th out	TORQUE 7th rem.	TORQUE 15th in	TORQUE 15th out	TORQUE 15th rem.	ACCEPT/REJECT
1	8.8	8.6	8.5	8.3	8.5	7.9	7.5	7.1	7.0	passed
2	10.0	9.4	9.0	8.6	7.8	7.0	8.4	7.4	7.0	passed
3	10.0	8.0	8.0	8.0	7.0	6.0	7.0	6.0	7.0	passed
4	9.6	9.2	8.4	8.0	7.6	7.0	8.5	8.0	7.2	passed
5	9.4	9.2	9.1	9.0	9.1	8.7	8.5	8.3	8.2	passed
6	10.5	9.1	8.6	9.7	8.7	8.1	9.0	8.0	7.5	passed
7	10.8	10.0	9.2	10.6	10.2	8.6	8.9	8.2	7.6	passed
8	9.6	9.0	8.4	8.8	7.6	7.4	8.2	8.0	7.4	passed
9	10.2	9.6	9.4	9.8	9.0	8.4	8.7	8.0	7.5	passed
10	10.0	9.4	9.0	8.6	7.8	7.0	8.4	7.4	7.0	passed
low	8.8	8.0	8.0	8.0	7.0	6.0	7.0	6.0	7.0	passed
avg.	9.9	9.2	8.8	8.9	8.3	7.6	8.3	7.6	7.3	passed
high	10.8	10.0	9.4	10.6	10.2	8.7	9.0	8.3	8.2	passed

CONTROLLED

We hereby certify that the above data is correct and conforms to the torque test requirements and that the fasteners have been manufactured and inspected in accordance with Airfasco Industries quality requirements.

Airfasco Industries

Quality Assurance Representative:

Tim West



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PHYSICAL TORQUE OUT & EMBRITTLEMENT TEST CERTIFICATION

AFC LOT NO.: 24274

DATE MFG.: 4/24/2014

SAMPLE SIZE: 10

QTY MFG.: 49,700

PART NO.: AFC59-832

PROCUREMENT SPECIFICATION: NASM25027 Rev 1 12/21/2012

CONFORMS TO: MS21059L08 per NASM1059 rev. 2, NAS686A3 rev. 13

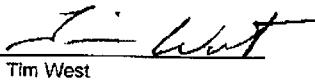
TORQUE OUT & EMBRITTLEMENT TEST: Minimum of 60 in-lbs. proof load applied in accordance with NASM25027 and NASM21059 with NAS9703 test bolts. An inspection for deformation of the nut and retainer was performed. The required torque load of 75-80% of tensile 1,968 lbs was maintained for hydrogen embrittlement inspection for cracks or nut deformation. After 72 hours minimum an examination under 10X magnification for cracks or deformation was performed and does meet all specification requirements. Torque then increased to failure and method of failure noted.

NUT SAMPLE	TORQUE OUT 60 in-lbs. min.	TORQUE OUT TO FAILURE	DATE and TIME TORQUED UP	DATE and TIME INSPECTED	ACCEPT REJECT	METHOD OF FAILURE
1	60.0	126.0	4/21/14 9:30 AM	4/24/14 9:30 AM	passed	strip deformations
2	60.0	131.0	4/21/14 9:30 AM	4/24/14 9:30 AM	passed	strip deformations
3	60.0	122.0	4/21/14 9:30 AM	4/24/14 9:30 AM	passed	strip deformations
4	60.0	125.0	4/21/14 9:30 AM	4/24/14 9:30 AM	passed	strip deformations
5	60.0	127.0	4/21/14 9:30 AM	4/24/14 9:30 AM	passed	strip deformations
6	60.0	132.0	4/21/14 9:30 AM	4/24/14 9:30 AM	passed	strip deformations
7	60.0	130.0	4/21/14 9:30 AM	4/24/14 9:30 AM	passed	strip deformations
8	60.0	121.0	4/21/14 9:30 AM	4/24/14 9:30 AM	passed	strip deformations
9	60.0	120.0	4/21/14 9:30 AM	4/24/14 9:30 AM	passed	strip deformations
10	60.0	124.0	4/21/14 9:30 AM	4/24/14 9:30 AM	passed	strip deformations
low		120.0				
avg.		125.8				
high		132.0				

CONTROLLED

We hereby certify that the above data is correct and conforms to the test requirements and that the fasteners have been manufactured and inspected in accordance with Airfasco Industries quality requirements.

Airfasco Industries
Quality Assurance Representative:


Tim West



2655 Harrison Ave S.W.
Canton, Ohio 44706
(330) 430-6190
www.Airfasco.com



PHYSICAL PUSH OUT ASSEMBLY TEST CERTIFICATION

AFC LOT NO.: 24274

DATE MFG.: 4/24/2014

SAMPLE SIZE: 10

QTY MFG.: 49,700

PART NO.: AFC59-832

PROCUREMENT SPECIFICATION: NASM25027 Rev 1 12/21/2012

CONFORMS TO: MS21059L08 per NASM1059 rev. 2, NAS686A3 rev. 13

PUSH OUT ASSEMBLY TEST: 80 lbs. min. (proof load) inspection for push out nut from the retainer assembly applied with MS16997 (3A) test screws. After minimum proof load an examination under 10X magnification for deformation was performed and does meet specification requirements. Force then increased to 150% of minimum requirement then increased force applied to failure and method of failure noted.

NUT SAMPLE	PUSH OUT 80 lbs. min.	PUSH OUT	PUSH OUT TO FAILURE	ACCEPT REJECT
1	80.0	226.0	ACC	retainer deformation
2	80.0	252.0	ACC	retainer deformation
3	80.0	246.0	ACC	retainer deformation
4	80.0	230.0	ACC	retainer deformation
5	80.0	225.0	ACC	retainer deformation
6	80.0	238.0	ACC	retainer deformation
7	80.0	246.0	ACC	retainer deformation
8	80.0	248.0	ACC	retainer deformation
9	80.0	250.0	ACC	retainer deformation
10	80.0	231.0	ACC	retainer deformation
low			ACC	
avg.			ACC	
high			ACC	

CONTROLLED

We hereby certify that the above data is correct and conforms to the torque test requirements and that the fasteners have been manufactured and inspected in accordance with Airfasco Industries quality requirements.

Airfasco Industries
Quality Assurance Representative:

Tim West



2655 Harrison Ave S.W.
Canton, Ohio 44706
(330) 430-6190
www.Airfasco.com



PHYSICAL AXIAL TENSILE TEST CERTIFICATION

AFC LOT NO.: 24274

DATE MFG.: 4/24/2014

SAMPLE SIZE: 10

QTY MFG.: 49,700

PART NO.: AFC59-832

PROCUREMENT SPECIFICATION: NASM25027 Rev 1 12/21/2012

CONFORMS TO: MS21059L08 per NASM1059 rev. 2, NAS686A3 rev. 13

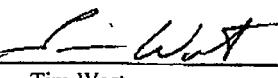
AXIAL TENSILE TEST: Method NASM1312-8 1,720 min. lbs. proof load inspection for nut deformation.
Maximum load Increased to failure before deformation, stripped threads or MS16997 (3A) test screws.

TENSILE SAMPLE	PROOF LOAD 1,720 LBS.	TENSILE TO FAILURE LBS.	METHOD OF FAILURE	ACCEPT REJECT
1	1,720	2,512	strip deformation	passed
2	1,720	2,426	strip deformation	passed
3	1,720	2,396	strip deformation	passed
4	1,720	2,358	strip deformation	passed
5	1,720	2,367	strip deformation	passed
6	1,720	2,452	strip deformation	passed
7	1,720	2,415	strip deformation	passed
8	1,720	2,468	strip deformation	passed
9	1,720	2,475	strip deformation	passed
10	1,720	2,418	strip deformation	passed
low		2,358		
avg.		2,429		
high		2,512		

CONTROLLED

We hereby certify that the above data is correct and conforms to the axial tensile test requirements and that the fasteners have been manufactured and inspected in accordance with Airfasco Industries quality requirements.

Airfasco Industries
Quality Assurance Representative


Tim West



2655 Harrison Ave S.W.
Canton, Ohio 44706
(330) 430-6190
www.Airfasco.com



METTALURGICAL EXAMINATION

AFC LOT NO.: 24274

DATE MFG.: 4/24/2014

SAMPLE SIZE: 10

QTY MFG.: 49,700

PART NO.: AFC59-832

PROCUREMENT SPECIFICATION: NASM25027 Rev 1 12/21/2012

CONFORMS TO: MS21059L08 per NASM1059 rev. 2, NAS686A3 rev. 13

MICRO EXAMINATION: The microstructure shows tempered martensitic grains. No decarburization or carburization was noted visually under 100X magnification. Mount shows flow lines are continuous and follow the general contour of the part as formed by the cold forming process. No indications of cracks, laps, seams or other defects were noted. Rockwell hardness HRC, Superficial 15-N, and Tukon micro-hardness Knoop / Vickers scale was performed. Material as mounted and inspected is satisfactory as inspected and conforms to specification requirements.

NUT					
HARDNESS SAMPLE	HRC	15-N	KNOOP	VHN	ACCEPT/REJECT
1	35	78	351	345	ACC
2	35	78	351	345	ACC
3	35	78	351	345	ACC
4	34	77	342	336	ACC
5	34	77	342	336	ACC
6	34	77	342	336	ACC
7	35	78	351	345	ACC
8	34	77	342	336	ACC
9	35	78	351	345	ACC
10	34	77	342	336	ACC
low	34	77	342	336	ACC
avg.	35	77	347	341	ACC
high	35	78	351	345	ACC

CONTROLLED

We hereby certify that the above data is correct and conforms to the metallurgical test requirements and that the fasteners have been manufactured and inspected in accordance with Airfasco Industries quality requirements.

Airfasco Industries
Quality Assurance Representative:

Tim West

AIRFASCO INDUSTRIES QUALITY CONTROL FORM 1011N ME

EXAMINATION OF PRODUCT

AFC LOT NO.: 24274

DATE MFG.: 4/24/2014

SAMPLE SIZE: 10

QTY MFG.: 49,700

PART NO.: AFC59-832

CONFORMS TO: MS21059L08 per NASM1059 rev. 2, NAS686A3 rev. 13

PROCUREMENT SPECIFICATION: NASM25027 Rev 1 12/21

#	CHARACTERISTICS	MAX.	MIN.	SAMPLE 1	SAMPLE 2	SAMPLE 3	SAMPLE 4	SAMPLE 5	SAMPLE 6	SAMPLE 7	SAMPLE 8	SAMPLE 9	SAMPLE 10
1	"A" LENGTH	.948	-	.920"	.919"	.919"	.916"	.918"	.918"	.919"	.916"	.919"	.920"
2	"B" WIDTH	.416	.290	.401"	.402"	.400"	.402"	.403"	.400"	.402"	.402"	.403"	.402"
3	"D" DIAMETER	-	.168	.175"	.175"	.175"	.175"	.175"	.175"	.175"	.175"	.175"	.175"
4	"P" DIAMETER	-	.100	.200"	.200"	.200"	.200"	.200"	.200"	.200"	.200"	.200"	.200"
5	"H" HEIGHT	.250	-	.234"	.233"	.234"	.233"	.232"	.231"	.234"	.235"	.234"	.233"
6	"J" LOCATION	.690	.686	.687"	.687"	.687"	.687"	.687"	.687"	.687"	.687"	.687"	.687"
7	"K" DIAMETER	.103	.098	.099"	.099"	.099"	.099"	.099"	.099"	.099"	.099"	.099"	.099"
8	"V" THICKNESS	.032	-	.026"	.026"	.026"	.026"	.026"	.026"	.026"	.026"	.026"	.026"
9	PRESENCE OF LOGO	-	-	ACC									
10	THREADS /T/ .1640-32 UNJC-3B	-	-	ACC									
11	BEARING SURFACE ROUGHNESS	< 125	-	60	60	60	60	60	60	60	60	60	60

Examination of product in accordance with NASM25027 NEW, SEP 1999.

Airfasco Industries
Quality Assurance Representative:


Tim West

CONTROLLED

Approved by Bruce Hogie
Revision Date: 2/13/2013

CERTIFICATE OF COMPLIANCE

SUPPLIER: BERINGER PLATING, INC.
1211 DeValera Ave.
Akron, OH 44310
330-633-8409 Fx 330-633-8447
sales@beringerplating.com

CUSTOMER: Airfasco Industries, Inc.

Beringer Invoice: 79706

P.O. Number: 60863

Part Number: MS21059 L08

Lot Number: 24274-01

Lot Quantity: 49,700 pcs

Specification: Cadmium Plate per AMS-QQ-P-416C Type II, Class 2 (Black)

Mercury Free Clause: No possibility exists for mercury contamination to occur during processing or testing of parts on this contract.

Coating Thickness: .0003 inches

Embrittlement Relief

Baked: 24 Hours at 375 F Within 1 Hour of Plating.

Inspection Level to applicable standard:

ACC. X

S-3 of MIL-STD-105D: 4 %

ASTM B602 Table II: 1.50%

Aircraft Braking System: 1%

Certified By: James Beringer Jr.

Date: 4/8/2014

James Beringer Jr.
President

CONTROLLED



CERTIFICATION OF PROCESS

CUSTOMER: AIRFASCO INDUSTRIES, INC
2655 HARRISON AVE SW
CANTON OH 44706

THIS IS TO CERTIFY THAT BRITE METAL INC. HAS PROCESSED THE FOLLOWING MATERIAL IN ACCORDANCE WITH THE MOST WIDELY ACCEPTED METALLURGICAL PROCEDURE.

PO #: 60851 **WEIGHT:** 183 **NO. BINS:** 1 **NO. PCS:** 49,700

PN#: MS21059L08 **LOT#:** 24274 **MATERIAL#:** 1050

BM ORDER NO: 166181 **CORE HARD SPECS:** HRC 33-35

PROCESS TO: AMS 2759

DATE RECEIVED: 3/20/14 **DATE SHIPPED:**

HEAT TREATING TEST RESULTS

NUMBER OF SAMPLES: 3

CORE HARDNESS: 34-35RC

SURFACE HARDNESS: 34-35RC@.002 34-35RC@.005

CASE DEPTH: ---

CORE HARDNESS AS QUENCHED: ---

CONTROLLED

INSPECTOR: JC

DATE: 3/24/14

AIRFASCO Industries

2655 Harrison Avenue SW Canton, OH 44706

Nondestructive Testing Certification Wet Fluorescent Magnetic Particle Inspection Technique

Part Data

Part Number	Lot Number	Dimensions	Part Description
MS21059L08	24274	.164-32 UNJF-3B	NUT, SELF-LOCKING, PLATE, TWO LUG, FLOATING, LOW HEIGHT STEEL, 125 KSI Ftu, 450°F

Reference Data

Specification	Procedure Number	Acceptance Criteria
ASTM E1444-05	MT-1	No Cracks, NASM25027

Inspection Equipment Data

Model Number	Manufacturer	Serial Number
H-800 Retro	Magnaflux Corporation	91R00150

Inspection Material Data

Particles	Mfr	Batch No.	Carrier	Mfr	Batch No.
14A	Magnaflux	10G078	MG II	Magnaflux	11K065

Technique Data

Type Current	Circular Field		Longitudinal Field	
	Headshot Amps	Central Conductor Amps	Coil shot Amps	Coil Turns
FWDC	N/A	200	N/A	5

Particle application by the flow method, continuous technique

Demagnetization performed by the AC Coil method, Residual field +/- 3

Inspection Results

Lot Size	Inspection Sample Size	Quantity accepted	Quantity rejected
49700	32	32	0

Notes: Circular mag only per NASM25027

Performed by / Level	Reviewed & Approved by:	Date
		4/21/14
D. SHOUP ASNT NDT LEVEL III	D. SHOUP ASNT NDT LIII #176608	

CONTROLLED

EVERLUBE® PRODUCTS

TEST REPORT

DATE: 2/05/2014
PRODUCT: Everlube® 620C
SPECIFICATION: SAE AS5272E, Type I
BATCH NUMBER: PC-14506
DATE OF MANUFACTURE: 2/05/2014
MANUFACTURING SITE: Peachtree City, GA
CUSTOMER P.O. #: 60822

DATE OF
MAR 13 2013

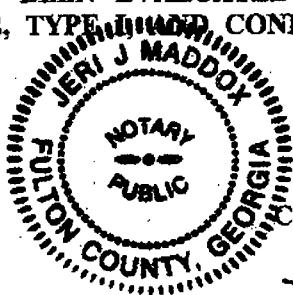
EXPIRATION

TEST RESULTS

PARAGRAPH	TEST	REQUIREMENTS	RESULTS
3.3	Film Appearance	Pass	Pass
3.3	Film Thickness	All Specimens 0.0003" - 0.0005" with no single readings less than 0.0002" or greater than 0.0007".	All Specimens 0.0003" - 0.0005"
3.4.1	Film Adhesion (ASTM D-2510, Procedure A)	Pass Per Spec.	Pass
3.4.4	Endurance Life (ASTM D-2625, Procedure A)	250 Min. Avg. None < 210 Min.	Test # 1 = 290 Min. Test # 2 = 255 Min. Test # 3 = 275 Min. Test # 4 = 270 Min. Test Average = 273 Min.
3.4.5	Load Carrying Capacity (ASTM D-2625, Procedure B)	2500 Lbf. Avg. None < 2250 Lbf.	Test # 1 = 2750 Lbf. Test # 2 = 2750 Lbf. Test Average = 2750 Lbf.
3.4.7	Sulfurous Acid-Salt Spray	Pass 4 Cycles	Pass
3.4.9	Solids Content	40% Minimum	40.1 %

CERTIFICATE OF CONFORMANCE

EVERLUBE PRODUCTS HEREBY CERTIFIES THAT THIS PRODUCT CONTAINS NO GRAPHITE OR POWDERED METALS AND HAS BEEN EVALUATED AGAINST THE QUALITY CONFORMANCE REQUIREMENTS OF SAE AS5272, TYPE I. IT CONFORMS TO THE REQUIREMENTS OF THAT SPECIFICATION.



CONTROLLED

Sworn to and subscribed before me
This 5 day of February 2014

Jeri J. Maddux
Notary Public

Comm. exp. 11-4-2016

CERTIFIED BY:

T. Murphy
Tim Murphy
Quality Assurance Technician
Carl H. Van Acker
Quality Assurance Manager

CERTIFICATE OF CONFORMANCE

CONSOLIDATED METAL SERVICE, INC
4764 TOPPS INDUSTRIAL PARKWAY
WILLOUGHBY, OH 44094
440-954-6800

6/26/13

Page# 1

TO:

AIRFASCO INDUSTRIES, INC.
2655 HARRISON AVE SW
CANTON, OH 44706

SHIP TO:

AIRFASCO INDUSTRIES, INC.
2655 HARRISON AVE. SW
CANTON OH 44706
330-430-6190

SIZE: .035 X 1.50 X COIL
GRADE: 1050 ANNEALED PER ASTM A684 & AMS 5085
COUNTRY OF ORIGIN: USA

Bill/Ladng# 002563 B/L Date 6/26/13 Sales Ord# 802341 01
Cust. P/O# 43331

Tag#	01	Heat#	NLPR0072D	MasterTag#	202874	01
C :	.52	Mn:	.64	P :	.008	S : .002
Ti:	.002			Mo:	.02	Cu: .15
		Sn:	.031	Ca:	.0005	N : .007
Rock:	RB 75					B : .0001
						Si: .210
						Cr: .05
						Ni: .06

Tag#	01	Heat#	NLPR0072D	MasterTag#	202874	01
C :	.52	Mn:	.64	P :	.008	S : .002
Ti:	.002			Mo:	.02	Cu: .15
		Sn:	.031	Ca:	.0005	N : .007
Rock:	RB 75					B : .0001
						Si: .210
						Cr: .05
						Ni: .06

WE HEREBY CERTIFY THE ABOVE FIGURES ARE ACCURATELY STATED, MEET YOUR
MATERIAL REQUIREMENTS AND ARE TRACEABLE IN OUR RECORDS BACK TO THE
PRODUCER AND/OR AN ACCREDITED TEST LABORATORY.

.....
QUALITY ASSURANCE MANAGER

CONTROLLED

15May08 6:38

TEST CERTIFICATE

No: CLE 213908

Sold By:

THREE D METALS, INC.

5462 INNOVATION DRIVE

VALLEY CITY, OHIO 44280

Tel: 330 220 0451 Fax: 330 220 0471

P/O No W26030-02

Ref

S/O No CLE 10429-001

B/L No CLE 119616-003 Shp 15May08

Inv No

Inv

CERTIFICATE OF ANALYSIS and TESTS

Cert. No: CLE 213908

15May08

Part No I902504064

C1050 C.R. SPRING STEEL ANNEALED
.0250 Nom X 4.0600"

Pcs 4 Wgt 3.705

Heat Number
280353

Tag No
534597

Pcs 4 Wgt 3.705

HRB=<68>/DECAR=<.00">/ELONG=<28.5%>/TSpsi=<73,000psi>
YSpsi=<57,000psi>/N=<.22>/REF=<5085F>

Heat Number
280353

*** Chemical Analysis ***
ORIGIN=<US> C=<.52> Mn=<.730> P=<.015> S=<.004> Si=<.249>
Cu=<.118> Ni=<.055> Cr=<.163> Mo=<.017> Al=<.035> N=<.009>
V=<.002> Nb=<.001> Ti=<.003> Sb=<.004> ASTM=<A682> *ASTM=<A684>
SAE=<J403>

THIS IS TO CERTIFY THAT THE CHEMICAL ANALYSIS
AND/OR PHYSICAL TEST RESULTS EXHIBITED HEREIN ARE
CORRECT, AS CONTAINED WITHIN THE RECORDS
OF THE COMPANY.

QUALITY MANAGER

John Bakuhn, Jr.
John Bakuhn, Jr.

Page: 1 Lost

CONTROLLED



2655 Harrison Ave. SW
Canton, Ohio 44706-3047
Phone: 330-430-6190
Fax: 330-430-6199

CERTIFICATE OF CONFORMANCE

DART AEROSPACE

I hereby certify that on 07/28/14 Airfasco Industries provided the supplies called for by Contract/PO Number PO25178 in accordance with all applicable requirements for shipment. I further state/ that the process certifications are in conformance with the contract requirements, including specifications and/or drawings, physical item identification (part number) and the quantity shown on this or attached acceptance document. The part numbers certified below have been manufactured in the United States.

Quality Assurance Representative

WM. DENT



AIRFASCO
INDUSTRIES
 MANUFACTURER OF AEROSPACE PRODUCTS

2655 HARRISON AVE. SW
 CANTON, OH 44706
 PHONE: (330)430-6190
 FAX: (330)430-6199

PHYSICAL AND CHEMICAL CERTIFICATION

AFC LOT NO.: 20681 DATE MFG.: 2/28/2012 SAMPLE SIZE: 10 QTY MFG.: 47,000

PART NO.: AFC42-428L PROCUREMENT SPECIFICATION: NASM25027 SEP 1999

CONFORMS TO: MS21042L4 per NASM21042 OCT 1998, NAS1291-4 rev. 13

HEAT TREAT PROCUREMENT SPECIFICATION: MIL-H-6875 H, HRC 37.00 – 42.00

VENDOR: Brite Metal CERT NO.: 156052 HARDNESS: HRC 37.00 40.00

PLATING PROCUREMENT SPECIFICATION: Cadmium Plate per AMS-QQ-P-416C, type 2, class 2

VENDOR: Lake City Plating CERT NO.: 85198-20681 PROCESS: bake 23 hours 375 F within 1 hour

LUBE PROCUREMENT SPECIFICATION: SAE AS5272C, type 1

VENDOR: Everlube CERT NO.: 11-0181 RESULTS: .0003" 96 hr salt spray

NUT MATERIAL:	UNS 87400, AISI 8740, AMS6322N, .275" wire									
HEAT:	A85488	MILL:	Ivac			COUNTRY OF MELT:			Canada	

ELEMENT-ID	-C-	-MN-	-P-	-S-	-SI-	-NI-	-CR-	-MO-	-CU-	-AI-	Other	Other
LADLE	0.410	0.780	0.010	0.001	0.210	0.420	0.420	0.217	0.120	0.030	-	-
CHECK	0.430	0.810	0.012	<.003	0.210	0.420	0.420	0.220	0.120	0.000	-	-

PHYSICAL PROPERTIES	AXIAL TENSILE	TORQUE IN MIN.	TORQUE OUT MAX.	TORQUE REMOVAL	WRENCH TORQUE	HARDNESS HRC 37-42
REQUIRED	6,200 lbs.	3.5 in-lbs.	30.0 in-lbs.	30.0 in-lbs.	150 in-lbs.	37.00-42.00
ACTUAL LOW	7,428 lbs.	11.5 in-lbs.	11.0 in-lbs.	10.9 in-lbs.	150 in-lbs.	37.00
ACTUAL AVG.	8,170 lbs.	17.2 in-lbs.	16.5 in-lbs.	15.8 in-lbs.	211 in-lbs.	38.50
ACTUAL HIGH	9,122 lbs.	22.7 in-lbs.	21.9 in-lbs.	20.6 in-lbs.	211 in-lbs.	40.00

72 hour stress embrittlement test 85% of tensile performed at 211 in-lbs., 5,270lbs in accordance with NASM1312-14.

NASM1312-8 max. load before deformation, strip or test bolt failure (lbs.)

Non-Destructive Magnetic Particle per ASTM-E-1444-05 sample lot size: 32

UNS G87400 is not a specialty grade steel per DFAR 252.225-7014.

DFAR compliant 252.225-7014 Domestic Specialty Metals Alternate 1.

100% Inspected Lot, C=0, 0/PPM - INSPEC100

Metallurgical Examination satisfactory.

Product is Mercury (Hg) free.

Made in the USA.

CONTROLLED

We hereby certify that the above data is correct and that the fasteners have been manufactured and inspected in accordance with Airfasco Industries quality requirements.

Airfasco Industries

Quality Assurance Representative:

Tim West

Tim West



2655 HARRISON AVE. SW
CANTON, OH 44706
PHONE: (330)430-6190
FAX: (330)430-6199

PHYSICAL TORQUE TEST CERTIFICATION

AFC LOT NO.: 20681 DATE MFG.: 2/28/2012 SAMPLE SIZE: 10 QTY MFG.: 47,000

PART NO.: AFC42-428L PROCUREMENT SPECIFICATION: NASM25027 SEP 1999

CONFORMS TO: MS21042L4 per NASM21042 OCT 1998, NAS1291-4 rev. 13

TORQUE TEST: Min. 3.5 in-lbs. max. 30.0 in-lbs. Installations are torque in values. Torques out values is the breakaway and removal unseated in the opposite assembly direction. First, seventh and fifteenth cycles with NAS9704-21 test bolts.

TORQUE SAMPLE	TORQUE 1st in	TORQUE 1st out	TORQUE 1st rem.	TORQUE 7th in	TORQUE 7th out	TORQUE 7th rem.	TORQUE 15th in	TORQUE 15th out	TORQUE 15th rem.	ACCEPT REJECT
1	18.5	17.8	16.8	17.6	16.9	16.0	17.0	16.6	15.5	ACC
2	19.9	18.7	18.3	19.1	17.7	16.9	17.8	16.9	16.4	ACC
3	15.0	13.9	13.7	14.2	13.1	11.8	12.8	11.5	11.0	ACC
4	22.7	21.9	20.6	19.5	18.0	17.8	16.5	15.7	15.3	ACC
5	20.8	20.3	20.0	18.9	18.4	17.6	17.4	16.6	15.9	ACC
6	18.3	18.2	17.7	17.8	17.6	17.2	17.5	17.1	16.6	ACC
7	19.1	19.3	18.4	18.6	18.9	18.0	18.2	18.5	17.5	ACC
8	15.5	15.0	14.5	13.5	12.5	11.8	11.5	11.0	10.9	ACC
9	17.5	16.9	16.7	15.9	15.2	14.9	14.7	14.5	14.0	ACC
10	18.4	17.7	16.9	15.6	14.9	13.8	14.9	13.7	12.6	ACC
low	15.0	13.9	13.7	13.5	12.5	11.8	11.5	11.0	10.9	ACC
avg.	18.6	18.0	17.4	17.1	16.3	15.6	15.8	15.2	14.6	ACC
high	22.7	21.9	20.6	19.5	18.9	18.0	18.2	18.5	17.5	ACC

CONTROLLED

We hereby certify that the above data is correct and conforms to the torque test requirements and that the fasteners have been manufactured and inspected in accordance with Airfasco Industries quality requirements.

Airfasco Industries

Quality Assurance Representative:

Tim West



2655 HARRISON AVE. SW
CANTON, OH 44706
PHONE: (330)430-6190
FAX: (330)430-6199

PHYSICAL WRENCH TORQUE & EMBRITTLEMENT TEST CERTIFICATION

AFC LOT NO.: 20681 DATE MFG.: 2/28/2012 SAMPLE SIZE: 10 QTY MFG.: 47,000
PART NO.: AFC42-428L PROCUREMENT SPECIFICATION: NASM25027 SEP 1999

CONFORMS TO: MS21042L4 per NASM21042 OCT 1998, NAS1291-4 rev. 13

WRENCH TORQUE TEST: 150 in-lbs. min. proof load, 211 in-lbs. (HE) inspection for nut deformation. A wrenching torque test was performed in accordance with NASM25027 and NASM21042 with NAS9704 test bolts. After 72 hours minimum an examination stress embrittlement under 10X magnification for deformation or cracks was performed and does meet specification requirements.

WRENCH SAMPLE	PROOF LOAD 150 in-lbs. min.	EMBRITTLEMENT 72 hours 211 in-lbs.	DATE and TIME TORQUED UP	DATE and TIME INSPECTED	EXAMINATION OF THE NUT	ACCEPT REJECT
1	150.0	211.0	2/24/12 10:00 AM	2/27/12 10:00 AM	no deformations	ACC
2	150.0	211.0	2/24/12 10:00 AM	2/27/12 10:00 AM	no deformations	ACC
3	150.0	211.0	2/24/12 10:00 AM	2/27/12 10:00 AM	no deformations	ACC
4	150.0	211.0	2/24/12 10:00 AM	2/27/12 10:00 AM	no deformations	ACC
5	150.0	211.0	2/24/12 10:00 AM	2/27/12 10:00 AM	no deformations	ACC
6	150.0	211.0	2/24/12 10:00 AM	2/27/12 10:00 AM	no deformations	ACC
7	150.0	211.0	2/24/12 10:00 AM	2/27/12 10:00 AM	no deformations	ACC
8	150.0	211.0	2/24/12 10:00 AM	2/27/12 10:00 AM	no deformations	ACC
9	150.0	211.0	2/24/12 10:00 AM	2/27/12 10:00 AM	no deformations	ACC
10	150.0	211.0	2/24/12 10:00 AM	2/27/12 10:00 AM	no deformations	ACC

CONTROLLED

We hereby certify that the above data is correct and conforms to the wrench test requirements and that the fasteners have been manufactured and inspected in accordance with Airfasco Industries quality requirements.

Airfasco Industries
Quality Assurance Representative: Tim West
Tim West



2655 HARRISON AVE. SW
CANTON, OH 44706
PHONE: (330)430-6190
FAX: (330)430-6199

PHYSICAL AXIAL TENSILE TEST CERTIFICATION

AFC LOT NO.: 20681 DATE MFG.: 2/28/2012 SAMPLE SIZE: 10 QTY MFG.: 47,000

PART NO.: AFC42-428L PROCUREMENT SPECIFICATION: NASM25027 SEP 1999

CONFORMS TO: MS21042L4 per NASM21042 OCT 1998, NAS1291-4 rev. 13

AXIAL TENSILE TEST: Method NASM1312-8 6,200 min. lbs. proof load inspection for nut deformation. Maximum load increased to failure before deformation, stripped threads or NAS9704-21 test bolt failure.

TENSILE SAMPLE	PROOF LOAD 6,200 LBS.	TENSILE TO FAILURE LBS.	METHOD OF FAILURE	ACCEPT REJECT
1	6,200	8,346	TEST BOLT	ACC
2	6,200	9,032	TEST BOLT	ACC
3	6,200	7,428	TEST BOLT	ACC
4	6,200	8,123	TEST BOLT	ACC
5	6,200	9,122	TEST BOLT	ACC
6	6,200	7,692	TEST BOLT	ACC
7	6,200	7,428	TEST BOLT	ACC
8	6,200	8,077	TEST BOLT	ACC
9	6,200	8,324	TEST BOLT	ACC
10	6,200	8,125	TEST BOLT	ACC
low		7,428		ACC
avg.		8,170		ACC
high		9,122		ACC

CONTROLLED

We hereby certify that the above data is correct and conforms to the tensile test requirements and that the fasteners have been manufactured and inspected in accordance with Airfasco Industries quality requirements.

Airfasco Industries

Quality Assurance Representative:

Tim West



2655 HARRISON AVE. SW
CANTON, OH 44706
PHONE: (330)430-6190
FAX: (330)430-6199

METALLURGICAL EXAMINATION

AFC LOT NO.: 20681 DATE MFG.: 2/28/2012 SAMPLE SIZE: 10 QTY MFG.: 47,000

PART NO.: AFC42-428L PROCUREMENT SPECIFICATION: NASM25027 SEP 1999

CONFORMS TO: MS21042L4 per NASM21042 OCT 1998, NAS1291-4 rev. 13

MICRO EXAMINATION: The microstructure shows tempered martensitic grains. No decarburization or carburization was noted visually under 100X magnification. Mount shows flow lines are continuous and follow the general contour of the part as formed by the cold forming process. No indications of cracks, laps, seams or other defects were noted. Rockwell hardness HRC, Superficial 15-N, and Tukon micro-hardness Knoop / Vickers scale was performed. Material as mounted and inspected is satisfactory as inspected and conforms to specification requirements.

HARDNESS SAMPLE	HRC	15-N	KNOOP	VHN	ACCEPT REJECT
1	38	79.4	380	372	ACC
2	40	80.4	402	392	ACC
3	37	78.8	370	363	ACC
4	38	79.4	380	372	ACC
5	39	79.9	391	382	ACC
6	40	80.4	402	392	ACC
7	38	79.4	380	372	ACC
8	40	80.4	402	392	ACC
9	39	79.9	391	382	ACC
10	37	78.8	370	363	ACC
low	37	78.8	370	363	ACC
avg.	39	79.7	387	378	ACC
high	40	80.4	402	392	ACC

CONTROLLED

We hereby certify that the above data is correct and conforms to the metallurgical test requirements and that the fasteners have been manufactured and inspected in accordance with Airfasco Industries quality requirements.

Airfasco Industries
Quality Assurance Representative:

Tim West

EXAMINATION OF PRODUCT

AFC LOT NO.: 20681

DATE MFG.: 2/28/2012

SAMPLE SIZE: 10

QTY MFG.: 47,000

PART NO.: AFC42-428L

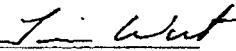
CONFORMS TO: MS21042L4 per NASM21042 OCT 1998, NAS1291-4 rev. 13

PROCUREMENT SPECIFICATION: NASM25027 SEP 1999

#	CHARACTERISTICS	MIN.	MAX.	SAMPLE 1	SAMPLE 2	SAMPLE 3	SAMPLE 4	SAMPLE 5	SAMPLE 6	SAMPLE 7	SAMPLE 8	SAMPLE 9	SAMPLE 10
1	"A" MAX. "B" MIN.	.386"	.420"	.409"	.407"	.409"	.404"	.409"	.409"	.409"	.408"	.407"	.409"
2	"H" HEIGHT	.204"	.219"	.213"	.208"	.214"	.208"	.207"	.215"	.207"	.207"	.208"	.208"
3	"W" FLATS (4) BEFORE CRIMP	.304"	.316"	.314"	.313"	.314"	.315"	.315"	.314"	.314"	.315"	.314"	.315"
4	"W" FLATS (2) AFTER CRIMP	.304"	.316"	.306"	.305"	.307"	.306"	.306"	.305"	.306"	.306"	.307"	.305"
5	"C" POINTS BEFORE CRIMP	.347"	-	.351"	.351"	.350"	.351"	.351"	.351"	.350"	.351"	.350"	.350"
6	"C" POINTS AFTER CRIMP	.347"	-	.347"	.347"	.347"	.348"	.348"	.348"	.348"	.348"	.348"	.347"
7	"G"	.007"	.036"	.025"	.024"	.025"	.025"	.025"	.025"	.025"	.024"	.024"	.024"
8	"D"	.250"	.356"	.272"	.275"	.275"	.272"	.272"	.272"	.272"	.275"	.274"	.275"
9	"E"	.090"	-	.115"	.115"	.115"	.115"	.115"	.115"	.115"	.114"	.115"	.115"
10	"F"	.057"	-	.071"	.071"	.071"	.071"	.071"	.071"	.071"	.071"	.071"	.071"
11	"J"	.019"	-	.031"	.031"	.031"	.031"	.028"	.030"	.030"	.028"	.028"	.028"
12	"X"	-	<.003"	<.001"	<.002"	<.001"	<.001"	<.001"	<.001"	<.001"	<.001"	<.002"	<.002"
13	PRESENCE OF LOGO	-	-	ACC									
14	THREADS /T/ .2500-28 UNJF-3B	-	-	ACC									
15	BEARING SURFACE ROUGHNESS	< 125	-	60	60	60	60	60	60	60	60	60	60

Examination of product in accordance with NASM25027 NEW, SEP 1999.

Airfasco Industries
Quality Assurance Representative:


Tim West

CONTROLLED

1/1

09-08-2007

09:50:21



MILL TEST CERTIFICATE

NAFCO ROLLING MILLS LP

P.O.BOX 322, L'ORIGINAL, ONTARIO, CANADA K0B 2G0
TEL: (519) 675-4371 FAX: (519) 675-4365



10700 0005 AIRFASCO C/O BCS MAPLE HEIGHTS
5800 STERLING AVENUE
MAPLE HEIGHTS (OH) 44137

ATTENTION : Dennis Dent

FAX : (330) 430-6199

P.C. Number	Order Number	Heat Number	Customer Spec	Spec Rev. No.	Customer Part No.	Date Rolled	04-Sep-2007	Date Chemical Analysis Performed	20-Jan-2007	Billet Order No.	Grade	Diameter
40587	10112018	A15488	57405XFG							250242	57405XAK	7.00 mm

Heat Analysis Data														
	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	Sn	Al	N	B	V
Spec Min*	.38	.75			.15	.40	.400	.200		.020				
Actual	.41	.78	.010	.001	.21	.12	.42	.420	.217	.008	.030	.0076	.0000	.003
Spec Max*	.43	1.00	.020	.020	.30	.20	.70	.800	.300		.060			

This is to certify that heat number A15488 is in conformance with the required specifications.

Heat analysis obtained by test methods ASTM E515 and ASTM E1019.

*Minimum and maximum refer to the required customer specification.

This is to certify that the material is in conformance with the required specifications.

Radioactive emissions are at background levels.

CONTROLLED

APPROVED BY:

W. B. D.
Supervisor, Chemistry Laboratory and Billet Inspection

ISSUED BY QUALITY ASSURANCE:

Date: 6 Sep 2007

E. Davis J.
Specification Clerk

This certificate shall not be reproduced except in full, without the written approval of Naaco Rolling Mills Inc. This certificate is not to be used by the client to claim product enhancement by NVLAP or any agency of the U.S. Government.
NVLAP only covers the chemistry presented within this certificate. All other data is not covered by the NVLAP accreditation.



Stork Herron Testing Laboratories

4/1/2008

Material Testing and Non-Destructive Testing

Dennis Dent
Alfresco Industries Inc
2655 Harrison Ave SW
Canton, OH 44708

6405 E. Schenck Road
Cleveland, OH 44113
USA

Date Received: 3/26/2008

Telephone: (216) 524-1450
Fax: (216) 524-1458
Website: www.storkherron.com

Test Report No.: AIR148-08-03-56668-1

TEST REPORT

P.O. No.:

Sample Description: One (1) .275" Dia. Wire, Material: B740 per AMS 6322N, Heat# A05468,
Mill: Ivaco

CHEMICAL ANALYSIS BY OES (SOP 10.05 R2)

Element	Result %	Min %	Max %
C	0.43	0.38	0.43
Mn	0.81	0.75	1.00
Si	0.21	0.15	0.35
P	0.012	0.000	0.025
S	0.003	0.000	0.025
Cr	0.42	0.40	0.60
Ni	0.42	0.40	0.70
Mo	0.22	0.20	0.30
Cu	0.12	0.00	0.35

GRAIN SIZE PER SOP 60.01 R1, SOP 60.02 R0, SOP 60.05 R1, SOP 60.18 R1, ASTM E 112-88
(Reapproved '04)¹², E 3-01, E 407-99

Direction	Transverse	Location	Random	Etchant	3% Nitric
Method	Comparison	Plate	lb	Magnification	100x

Average Grain Size
ASTM # 8.0

Requirement: 5.0 or finer

The above document was performed in accordance with Herron Testing Laboratories' Quality Assurance Program (Edition 1, Revision 2 dated 10/07). Information contained in this report are facts of true material, information and/or specifications furnished by the client and are not a statement of or imply of no relation as to the fitness of the material tested or analyzed for any particular purpose or use. This report is the confidential property of our client and may not be used for advertising purposes. This report shall not be reproduced except in full, without written approval of this laboratory. The reporting of lot no, lot size or individual elements or values on this document may be provided as a summary under Federal Methods including PDR-1 or TIA-10, Chapter 17. Sample retention may be provided for a minimum of 30 days following issuance of test results, at which point they will be discarded unless modified to writing by the client. This material was not contaminated by mercury or other toxic volatiles during the handling and processing in Stork-Herron Testing Laboratories facilities.


Michael R. Gaydos
General Manager, COO

CONTROLLED



Stork Herron Testing Laboratories

4/1/2008

Material Testing and Non-Destructive Testing

Dennis Dent
Alfasco Industries Inc
2855 Harrison Ave SW
Canton, OH 44708

5406 E. 8th Road
Cleveland, OH 44131
USA

Date Received: 3/26/2008

Telephone : (216) 824-1460
Fax : (216) 824-1469
Website : www.storkherron.com

Test Report No.: AIR148-08-03-56866-1

TEST REPORT

P.O. No.:

MACROETCH TEST PER SOP 60.28 R0, ASTM E 381-01 (Reapproved 2008), E 349-00 (Reapproved 2008)

The material is uniform and sound with no evidence of excessive segregation.

Rating	
Plate I	Plate II
S-1	
R-1	
C-1	None

Requirement: No imperfections worse than S-2, R-1, C-2.

DECARBURIZATION PER SOP 60.18 R1, SOP 60.20 R0, SOP 60.22 R1, ASTM E 1077-01 (Reapproved '05)

Direction	Transverse	Location	Random
Etchant	3% Nitric	Magnification	100x

No decarburization detected.

Requirement: 0.010" maximum depth of decarburization.

The above services were performed in accordance with Herron Testing Laboratories' Quality Assurance Program (QAP) File 1, Revision 3, dated 1/20/07. Information and data contained in this report are derived from material, information and/or specifications furnished by the client, and exclude any expressed or implied warranties as to the fitness of such material, information and/or specifications furnished for any particular purpose or use. This report is the confidential property of the client and may only be used for the client's purposes. This report shall not be reproduced except in full, without written approval of the laboratory. The reporting of data, facilities or knowledge herein shall not entitle the client to any rights or immunities under any laws, including Federal Law Title 19, Chapter 47. All materials furnished to the laboratory under this contract are held for a minimum of 90 days to ensure issuance of test results, at which point they will be destroyed unless ordered by written by the client. This material was not systematically identified or tracked during the handling and processing at Stork-Herron Testing Laboratories facilities.

Michael R. Guydos
General Manager, COO

CONTROLLED

4/1/2008

Material Testing and Non-Destructive Testing

Dennis Dent
Alfasco Industries Inc
2855 Harrison Ave SW
Canton, OH 44708

5405 E. Schaeff Road
Cleveland, OH 44131
USA

Date Received: 3/26/2008

Telephone: (216) 624-1450
Fax: (216) 624-1459
Website: www.storkherron.com

Test Report No.: AIR148-08-03-50088-1

TEST REPORT

P.O. No.:

MAGNETIC PARTICLE INSPECTION REPORT

Standard:	AMS 2301J		
Procedure:	SOP 42.04		
METHOD			
<input type="checkbox"/> Dry		<input checked="" type="checkbox"/> Wet	
PARTICLES			
Magnatech Particles:	Part Preparation:	Wet Particle Carrier:	
<input type="checkbox"/> 6A Red <input checked="" type="checkbox"/> 14A	<input checked="" type="checkbox"/> None Required	<input checked="" type="checkbox"/> Magnatech Carrier II	
<input type="checkbox"/> 3A Black <input type="checkbox"/> 14AM	<input type="checkbox"/> Solvent Clean	<input type="checkbox"/> Pre Mixed	
<input type="checkbox"/> 1 Gray <input type="checkbox"/> Other	<input type="checkbox"/> Grinding	<input type="checkbox"/> Concentration MI	
Batch No. 05A089			
Part Other			
Batch No. 07C088			
CURRENT			
<input type="checkbox"/> AC	<input checked="" type="checkbox"/> FWDC		
<input type="checkbox"/> Central Conductor (AMPS)	<input checked="" type="checkbox"/> Head Shot (AMPS) 400		
<input type="checkbox"/> Coil (AMPS)	<input type="checkbox"/> Probe (AMPS/Spacing)		
Field Verified by: <input checked="" type="checkbox"/> Pie Gage <input type="checkbox"/> QQI	<input type="checkbox"/> Hall Effect Probe		
EQUIPMENT			
<input checked="" type="checkbox"/> Magnatech H-720	S/N: 81471	Cal Due Date: 9/24/08	
<input type="checkbox"/> Yoke <input type="checkbox"/> AC <input type="checkbox"/> DC	S/N: Spacing:	Cal Due Date:	

The above services were performed in accordance with Herron Testing Laboratories' Quality Assurance Program Edition 1, Appendix 3 dated 10/07. Information and statements in this report are checked from methods, information and specifications furnished to us by the customer. Information and statements in this report are the property of the customer and are not to be reproduced or distributed without the express written permission of the customer. This report is the confidential property of our client and may not be used for advertising purposes. This report will not be reproduced except by us, without written approval of the laboratory. The recording of this report, including the entire contents, is the exclusive right of us, except to the extent that it may be lawfully made in accordance with the provisions of Title 17, Chapter 17, of the United States Code. This report may be published as a history under Federal Rules of Evidence Rule 803(17). Sample records are held for a minimum of 60 days following issuance of this report, at which point they will be disposed of unless recalled in writing by the client. This material was not contaminated by memory or deducted volume during the handling and processing at Stork Herron Testing Laboratories facilities.



Michael R. Gaydos
General Manager, COO

CONTROLLED



Stork Herron Testing Laboratories

4/1/2008

Material Testing and Non-Destructive Testing

Dennis Dent
Alfasco Industries Inc
2055 Harrison Ave SW
Canton, OH 44108

8405 E. 8th Street
Cleveland, OH 44131
USA

Date Received: 3/26/2008

Telephone : (216) 524-1450
Fax : (216) 524-1459
Web site : www.storkherron.com

Test Report No.: AIR148-08-03-56666-1

TEST REPORT

P.O. No.:

MAGNETIC PARTICLE INSPECTION RESULTS	
Quantity	Results
1 PC	ACCEPTABLE 0 FREQUENCY 0 SEVERITY
Comments:	
Marking Requirements:	
Demag and post cleaning requirements: < 2 Gauss	
Inspected by: Matthew Novek	Certification: ASNT-SNT-TC-1A Level <input type="checkbox"/> II <input checked="" type="checkbox"/> III

CONFORMANCE

These tools meet the requirements of AMS 6322N. The sample is acceptable per AMS 2301J.

The above services were performed in accordance with Herron Testing Laboratories' Quality Assurance Program (Edition 7, Xylex's 2 dated 1/2007). Information and statements in this report are derived from test data, information under specifications furnished by the client and exclude any expressed or implied warranties as to the fitness of the analysis for any particular purpose or intent. This report is the confidential property of our client and may not be used for advertising purposes. This report shall not be reproduced except in full, without written approval of this laboratory. The reporting of this data is subject to Federal Law Title 19, Chapter 41. This document may be published as a testimony under Federal Statute, including Federal Law Title 19, Chapter 41. Sample remnants are held for a minimum of 30 days following issuance of test results, at which point they will be discarded unless held in writing by the client. This material was not contaminated by mercury or chlorinated solvents during the handling and processing at Stork-Herron Testing Laboratories, Toledo.

Michael R. Gaydos
General Manager, COO

CONTROLLED

BRITE METAL

CERTIFICATION OF PROCESS

CUSTOMER: AIRFASCO INDUSTRIES, INC
2655 HARRISON AVE SW
CANTON OH 44706

THIS IS TO CERTIFY THAT BRITE METAL INC. HAS PROCESSED THE FOLLOWING MATERIAL IN ACCORDANCE WITH THE MOST WIDELY ACCEPTED METALLURGICAL PROCEDURE.

PO #: 23643 **WEIGHT:** 142 LBS **NO. BIN:** 1 **NO. PCS:** 47,000

PN#: AFC42-428-8740 **LOT#:** 20681

BM ORDER NO: 156052 **MTL#:** 8740 **CORE HARD SPECS:** HRC 37-42

SPECIFICATIONS: AMS-H-6875A

DATE RECEIVED: 12/9/10 **DATE SHIPPED:** 12/11/10

HEAT TREATING TEST RESULTS

NUMBER OF SAMPLES: 10

CORE HARDNESS: RC 37/40

SURFACE HARDNESS: Micro-Ok

CASE DEPTH: N/A

CORE HARDNESS AS QUENCHED: N/A

CONTROLLED

INSPECTOR: Q

DATE 12/11/10

LAKE CITY

1701 Lake Avenue • Ashtabula, Ohio 44004 • 440-964-3555 • FAX 440-964-2399

WWW.LAKECITYPLATING.COM

January 26, 2011

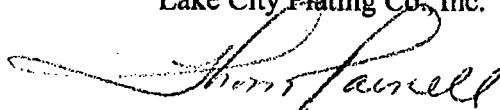
AirFasco Industries
2655 Harrison Avenue SW
Canton, OH 44706-3047

Subject: Part No. AFC 42-428-8740
P. O. No. 23665
Delivered on 1/26/11

“CERTIFICATE OF COMPLIANCE”

We hereby certify that the above parts were cadmium and black chromate per spec. AMS-QQ-P-416C, Type 2, Class 2 plus baked for 23 hours with .0003" thickness.

Lake City Plating Co., Inc.



Thom Parnell
Plant Manager

CONTROLLED

mrg

AIRFASCO	
LOT # <u>20681</u>	
WT <u>142 lbs</u> QTY <u>47,000</u>	

85198
RECEIVED JAN 28, 2011

EVERLUBE® PRODUCTS

TEST REPORT

DATE: 7/06/2011
PRODUCT: Everlube® 620C
SPECIFICATION: SAE AS5272E, Type I
BATCH NUMBER: PC-12090
DATE OF MANUFACTURE: 7/06/2011
MANUFACTURING SITE: Peachtree City, GA
TEST REPORT NUMBER: 11-0181
CUSTOMER P.O. #: 42643

DATE OF

AUG 08 2012

TEST RESULTS

PARAGRAPH	TEST	REQUIREMENTS	EXPIRATION
3.3	Film Appearance	Pass	Pass
3.3	Film Thickness	All Specimens 0.0003" – 0.0005" with no single readings less than 0.0002" or greater than 0.0007".	All Specimens 0.0003" – 0.0005"
3.4.1	Film Adhesion (ASTM D-2510, Procedure A)	Pass Per Spec	Pass
3.4.4	Endurance Life (ASTM D-2625, Procedure A)	250 Min. Avg. None < 210 Min.	Test # 1 = 335 Min. Test # 2 = 310 Min. Test # 3 = 370 Min. <u>Test # 4 = 295 Min.</u> Test Average = 328 Min.
3.4.5	Load Carrying Capacity (ASTM D-2625, Procedure B)	2500 Lbf. Avg. None < 2250 Lbf.	Test # 1 = 2750 Lbf. <u>Test # 2 = 2750 Lbf.</u> Test Average = 2750 Lbf.
3.4.7	Sulfurous Acid-Salt Spray	Pass 4 Cycles	Pass
3.4.9	Solids Content	40% Minimum	43.7 %

CERTIFICATE OF CONFORMANCE

EVERLUBE PRODUCTS HEREBY CERTIFIES THAT THIS PRODUCT CONTAINS NO GRAPHITE OR POWDERED METALS AND HAS BEEN EVALUATED AGAINST THE QUALITY CONFORMANCE REQUIREMENTS OF SAE AS5272, TYPE I, AND CONFORMS TO THE REQUIREMENTS OF THAT SPECIFICATION.

CONTROLLED

Sworn to and subscribed before me

This 16 day of July, 2011.

Katherine Raudael
Notary Public

CERTIFIED BY:

Tim Murphy
Tim Murphy
Quality Assurance Technician
Carl H. Van Acker
Quality Assurance Manager

AIRFASCO Industries

2655 Harrison Avenue SW Canton, OH 44706

Nondestructive Testing Certification Wet Fluorescent Magnetic Particle Inspection Technique

Part Data

Part Number	Lot Number	Dimensions	Part Description
AFC42-428-8740	20681	.250-28 UNJF 3B	HEX FLANGE NUT, SELF LOCKING 450°

Reference Data

Specification	Procedure Number	Acceptance Criteria
ASTM E1444-05	MT-1	No Cracks, NASM 25027

Inspection Equipment Data

Model Number	Manufacturer	Serial Number
H-800 Retro	Magnaflux Corporation	91R00150

Inspection Material Data

Particles	Mfr	Batch No.	Carrier	Mfr	Batch No.
14A	Magnaflux	10G078	MG II	Magnaflux	10K091

Technique Data

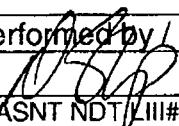
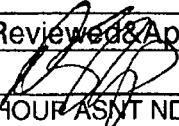
Type Current	Circular Field		Longitudinal Field	
	Headshot Amps	Central Conductor Amps	Coil shot Amps	Coil Turns
FWDC	N/A	200	N/A	5

Particle application by the flow method, continuous technique

Inspection Results

Lot Size	Inspection Sample Size	Quantity accepted	Quantity rejected
47000	32	32	0

Notes: Circular mag only per NASM 25027.

Performed by / Level	Reviewed & Approved by:	Date
		02/15/12
D. SHOUP ASNT NDT LIII#176608	D. SHOUP ASNT NDT LIII#176608	



2655 Harrison Ave. SW
Canton, Ohio 44706-3047
Phone: 330-430-6190
Fax: 330-430-6199

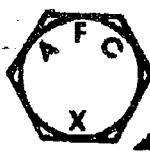
CERTIFICATE OF CONFORMANCE

DART AEROSPACE

I hereby certify that on 07/28/14 Airfasco Industries provided the supplies called for by Contract/PO Number PO25178 in accordance with all applicable requirements for shipment. I further state/ that the process certifications are in conformance with the contract requirements, including specifications and/or drawings, physical item identification (part number) and the quantity shown on this or attached acceptance document. The part numbers certified below have been manufactured in the United States.

Quality Assurance Representative

WM. DENT



AIRFASCO
INDUSTRIES
MANUFACTURER OF AEROSPACE PRODUCTS

2655 HARRISON AVE. SW
CANTON, OH 44706
PHONE: (330)430-6190
FAX: (330)430-6199

PHYSICAL AND CHEMICAL CERTIFICATION

DATE MFG.: 01/12/11

PART NO.: AN6-41A per NASM6-41A rev. 2

AFC LOT NO.: 20120

QTY MFG.: 6,600

PROCUREMENT SPECIFICATION: Produced per NASM 6812 rev. 2

HEAT TREAT

VENDOR: Brite Metal

CERTIFICATION NO.: 156206

PROCUREMENT SPECIFICATION: Heat Treat per AMS-H-6875 A

PLATING

VENDOR: Beringer Plating

CERTIFICATION NO.: 61616

PROCUREMENT SPECIFICATION: Cadmium Plate per AMS-QQ-P-416C, Type II, Class 2

MATERIAL

MILL: Ivaco

COUNTRY OF MELT: Canada

HEAT: W95376

GRADE SPECIFICATION: Alloy Steel per AMS 6300 E, Type 4037 .390"

4037 MATERIAL CHEMISTRY											
ELEMENT-ID.	-C-	-MN-	-P-	-S-	-SI-	-NI-	-CR-	-MO-	-CU-	-AL-	Other
LADLE	.380	.800	.009	.004	.190	.080	.090	.240	.040	.042	

PHYSICAL PROPERTIES				
PHYSICAL	TENSILE	YIELD	SHEAR	HARDNESS
REQUIRED	10,100 lbs.	7,740 lbs.	8,280 lbs.	HRC 26-32
ACTUAL	13,207 lbs.	12,492 lbs.	8,831 lbs.	HRC 28-31

We hereby certify that the above data is correct and that the fasteners have been manufactured and inspected in accordance with Airfasco Industries quality requirements.

Airfasco Industries
Quality Assurance Representative:


Wm. Dent



2655 Harrison Ave. SW
Canton, Ohio 44706-3047
Phone: 330-430-6190
Fax: 330-430-6199

CERTIFICATE OF CONFORMANCE

DART AEROSPACE

I hereby certify that on 07/28/14 Airfasco Industries provided the supplies called for by Contract/PO Number **PO25178** in accordance with all applicable requirements for shipment. I further state/ that the process certifications are in conformance with the contract requirements, including specifications and/or drawings, physical item identification (part number) and the quantity shown on this or attached acceptance document. The part numbers certified below have been manufactured in the United States.

Quality Assurance Representative

WM. DENT



2655 HARRISON AVE. SW
CANTON, OH 44706
PHONE: (330)430-6190
FAX: (330)430-6199

PHYSICAL AND CHEMICAL CERTIFICATION

DATE MFG.: 10/25/10

PART NO.: AN6-40A per NASM6-40A rev. 2

AFC LOT NO.: 18992

QTY MFG.: 4,300

PROCUREMENT SPECIFICATION: Produced per NASM 6812 rev. 2

HEAT TREAT

VENDOR: Brite Metal

CERTIFICATION NO.: 155378

PROCUREMENT SPECIFICATION: Heat Treat per AMS-H-6875 A

PLATING

VENDOR: Beringer Plating

CERTIFICATION NO.: 60471

PROCUREMENT SPECIFICATION: Cadmium Plate per AMS-QQ-P-416C, Type II, Class 2

MATERIAL

MILL: Charter

COUNTRY OF MELT: USA

HEAT: 392260

GRADE SPECIFICATION: Alloy Steel per AMS 6300 E, Type 4037, .406"

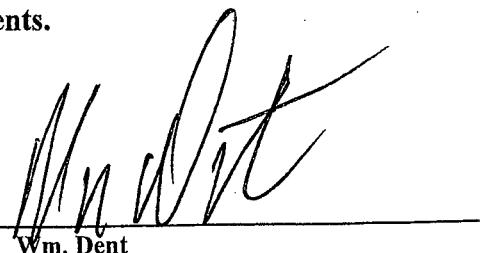
4037 MATERIAL CHEMISTRY											
ELEMENT-ID.	-C-	-MN-	-P-	-S-	-SI-	-NI-	-CR-	-MO-	-CU-	-AL-	Other
LADLE	.380	.840	.008	.012	.230	.040	.050	.210	.080	.024	

PHYSICAL PROPERTIES				
PHYSICAL	TENSILE	YIELD	SHEAR	HARDNESS
REQUIRED	10,100 lbs.	7,740 lbs.	8,280 lbs.	HRC 26-32
ACTUAL	13,228 lbs.	12,511 lbs.	8,849 lbs.	HRC 28-31

Non-Destructive Magnetic Particle per ASTM-E-1444-05

We hereby certify that the above data is correct and that the fasteners have been manufactured and inspected in accordance with Airfasco Industries quality requirements.

Airfasco Industries
Quality Assurance Representative:


Wm. Dent



2655 Harrison Ave. SW
Canton, Ohio 44706-3047
Phone: 330-430-6190
Fax: 330-430-6199

CERTIFICATE OF CONFORMANCE

DART AEROSPACE

I hereby certify that on 07/28/14 Airfasco Industries provided the supplies called for by Contract/PO Number **PO25178** in accordance with all applicable requirements for shipment. I further state/ that the process certifications are in conformance with the contract requirements, including specifications and/or drawings, physical item identification (part number) and the quantity shown on this or attached acceptance document. The part numbers certified below have been manufactured in the United States.

Quality Assurance Representative


WM. DENT



2655 HARRISON AVE. SW
CANTON, OH 44706
PHONE: (330)430-6196
FAX: (330)430-6199

PHYSICAL AND CHEMICAL CERTIFICATION

DATE MFG.: 07/26/07

PART NO.: AN3-35A per NASM3-35A rev. 1

AFC LOT NO.: 12895

QTY MFG.: 64,400

PROCUREMENT SPECIFICATION: Produced per NASM 6812 rev. 2

HEAT TREAT

VENDOR: Brite Metal

CERTIFICATION NO.: B-135784

PROCUREMENT SPECIFICATION: Heat Treat per MIL-H-6875 H

PLATING

VENDOR: Beringer Plating

CERTIFICATION NO.: 45129

PROCUREMENT SPECIFICATION: Cadmium Plate per QQ-P-416, Type II, Class 2,F

MATERIAL

MILL: Ivaco COUNTRY OF MELT: Canada HEAT: A81379

GRADE SPECIFICATION: Alloy Steel per, AMS6322 K, Type 8740, .218"

8740 MATERIAL CHEMISTRY											
ELEMENT-ID.	-C-	-MN-	-P-	-S-	-SI-	-NI-	-CR-	-MO-	-CU-	-AL-	Other
LADLE	.400	.790	.004	.004	.240	.440	.470	.208	.150	.044	

PHYSICAL PROPERTIES				
PHYSICAL	TENSILE	YIELD	SHEAR	HARDNESS
REQUIRED	2,210 lbs.	1,690 lbs.	2,125 lbs.	HRC 26-32
ACTUAL	3,212 lbs.	2,701 lbs.	2,457 lbs.	HRC 29-31

Non-Destructive Magnetic Particle per ASTM-E-1444-01

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Airfasco Industries
Quality Assurance Representative: _____



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Canton, Ohio 44706-3047
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Quality Assurance Representative


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PHYSICAL AND CHEMICAL CERTIFICATION

DATE MFG.: 06/27/13

PART NO.: AN5C15 per NASM5C15 rev. 2

AFC LOT NO.: 23507

QTY MFG.: 750

PROCUREMENT SPECIFICATION: Produced per NASM 6812

HEAT TREAT

VENDOR: Bodycote

CERTIFICATION NO.: 16297 (14122)

PROCUREMENT SPECIFICATION: Heat Treat per AMS-H-6875 A

PLATING

VENDOR: AFC

CERTIFICATION NO.: 13-23507

PROCUREMENT SPECIFICATION: Passivate per AMS2700, Method 1, QQ-P-35

MATERIAL

MILL: Ugine

COUNTRY OF MELT: France

HEAT: G9359

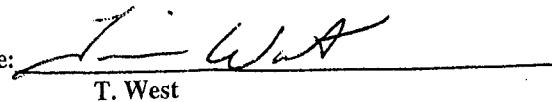
GRADE SPECIFICATION: ASTM A493, MIL-S-18732, AMS 5628 D, Type 431 SS, .306"

431SS MATERIAL CHEMISTRY											Other
ELEMENT-ID.	-C-	-MN-	-P-	-S-	-SI-	-NI-	-CR-	-MO-	-CU-	-Other-	Other
LADLE	.140	.560	.019	.008	.300	1.60	15.75	.050	.060		

PHYSICAL PROPERTIES				
PHYSICAL	TENSILE	YIELD	SHEAR	HARDNESS
REQUIRED	6,500 lbs.	4,980 lbs.	5,750 lbs.	HRC 26-32
ACTUAL	8,327 lbs.	7,919 lbs.	6,864 lbs.	HRC 30

We hereby certify that the above data is correct and that the fasteners have been manufactured and inspected in accordance with Airfasco Industries quality requirements.

Airfasco Industries
Quality Assurance Representative:


T. West



2655 Harrison Ave. SW
Canton, Ohio 44706-3047
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